Service Manual

Service Manual
GS290

Model : GS290
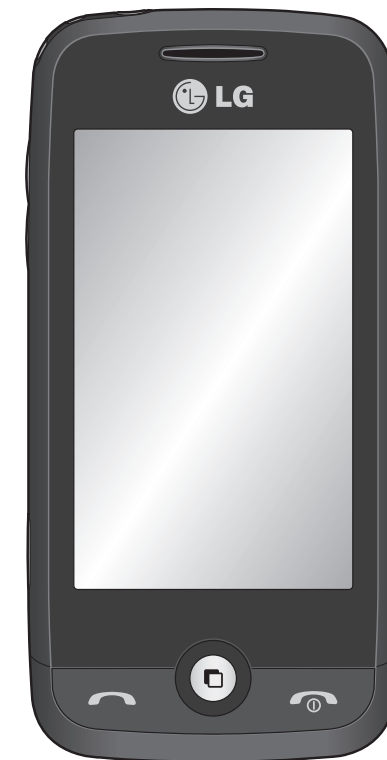
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1. INTRODUCTION

1.1. Purpose

This manual provides the information necessary to repair, calibration, description and download the features of the GS290.

1.2. Regulatory Information

1.2.1. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges you're your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. LGE does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it. LGE will not be responsible for any charges that result from such unauthorized use.

1.2.2. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

1.2.3. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the GS290 or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

1.2.4. Maintenance Limitations

Maintenance limitations on the GS290 must be performed only at the LGE or its authorized agents. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

1.2.5. Notice of Radiated Emissions

The GS290 complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

1.2.6. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

1.2.7. Interference and Attenuation

An GS290 may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

1.2.8. Electrostatic Sensitive Devices

ATTENTION

Boards, which contains Electrostatic Sensitive Device(ESD), are indicated by the sign. Following information is ESD handling: Service personnel should ground themselves by using a wrist strap when exchange system boards.

When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded. Use a suitable, grounded soldering iron. Keep sensitive parts in these protective packages until these are used. When returning system boards or parts such as EEPROM to the factory, use the protective package as described.

1.3. ABBREVIATION

For the purposes of this manual, following abbreviations apply:

◆ **APC**   Automatic Power Control
◆ **BB**   Baseband
◆ **BER**   Bit Error Ratio
◆ **CC-CV**   Constant Current – Constant Voltage
◆ **CLA**   Cigar Lighter Adapter
◆ **DAC**   Digital to Analog Converter
◆ **DCS**   Digital Communication System
◆ **dBm**   dB relative to 1 milli-watt
◆ **DSP**   Digital Signal Processing
◆ **EEPROM**   Electrical Erasable Programmable Read-Only Memory
◆ **EGPRS**   Enhanced General Packet Radio Service
◆ **EL**   Electroluminescence
◆ **ESD**   Electrostatic Discharge
◆ **FPCB**   Flexible Printed Circuit Board
◆ **GMSK**   Gaussian Minimum Shift Keying
◆ **GPIB**   General Purpose Interface Bus
◆ **GPRS**   General Packet Radio Service
◆ **GSM**   Global System for Mobile Communications
◆ **IPUI**   International Portable User Identity
◆ **IF**   Intermediate Frequency
◆ **LCD**   Liquid Crystal Display
◆ **LDO**   Low Drop Output
◆ **LED**   Light Emitting Diode
◆ **LGE**   LG Electronics
◆ **OPLL**   Offset Phase Locked Loop
◆ **PAM**   Power Amplifier Module
◆ **PCB**   Printed Circuit Board
◆ **PGA**   Programmable Gain Amplifier
◆ **PLL**   Phase Locked Loop
◆ **PSTN**   Public Switched Telephone Network
◆ **RF**   Radio Frequency

1. INTRODUCTION

◆ **RLR**   Receiving Loudness Rating
◆ **RMS**   Root Mean Square
◆ **RTC**   Real Time Clock
◆ **SAW**   Surface Acoustic Wave
◆ **SIM**   Subscriber Identity Module
◆ **SLR**   Sending Loudness Rating
◆ **SRAM**   Static Random Access Memory
◆ **STMR**   Side Tone Masking Rating
◆ **TA**   Travel Adapter
◆ **TDD**   Time Division Duplex
◆ **TDMA**   Time Division Multiple Access
◆ **UART**   Universal Asynchronous Receiver/Transmitter
◆ **VCO**   Voltage Controlled Oscillator
◆ **DCXO**   Digitally Controled Crystal Oscillator
◆ **WAP**   Wireless Application Protocol
◆ **8PSK**   8 Phase Shift Keying

2. PERFORMANCE

2.1 H/W Feature

Item	Feature	Comment
Standard Battery	Li-ion, 900mAh	
AVG TCVR Current	250mA typ	@PL5
Standby Current	2.3 mA typ	@PP9
Talk time	3 hours (GSM TX Level 7)	
Standby time	Over 250 hours (Paging Period:9, RSSI: -85dBm)	
Charging time	Under 3 hours	
RX Sensitivity	EGSM/GSM850:-105dBm↓ ,DCS/PCS:-105dBm↓	
TX output power	EGSM/GSM850 : 33dBm (@PL 5) DCS/PCS: 30dBm (@PL 0)	
GPRS compatibility	Class 10	
SIM card type	3V Small	
Display	Main 240 × 400 pixels, 3" WQVGA, 262K color	
Status Indicator	Send Key, Shortcut Key, Volume Up/Down Key, PWR Key, Camera Key, Lock Key	
ANT	Built in antenna	
EAR Phone Jack	3.5Pi Headset jack	
PC Synchronization	Yes	
Speech coding	HR/EFR/FR/AMR	
Data and Fax	Yes	
Vibrator	Yes	
Buzzer	No	
Voice Recoding	Yes	
C-Mic	Yes	
Receiver	Yes	
Travel Adapter	Yes	
Options	Bluetooth hands-free kit, Data Kit	

2. PERFORMANCE

2.2 Technical specification

Item	Description	Specification					
1	Frequency Band	GSM850 TX: 824 + 0.2 x n MHz RX: 869 + 0.2 x n MHz (n = 1 ~ 124) EGSM TX: 890 + 0.2 x (n-1024) MHz RX: 935 + 0.2 x (n-1024) MHz (n = 975 ~ 1023) DCS1800 TX: 1710 + (n-511) × 0.2 MHz (n = 512 ~ 885) RX: TX + 95 MHz PCS1900					
2	Phase Error	RMS < 5 degrees Peak < 20 degrees					
3	Frequency Error	< 0.1ppm					
4	Power Level	GSM850/EGSM					
		Level	Power	Toler.	Level	Power	Toler.
		5	33 dBm	±2dB	13	17 dBm	±3dB
		6	31 dBm	±3dB	14	15 dBm	±3dB
		7	29 dBm	±3dB	15	13 dBm	±3dB
		8	27 dBm	±3dB	16	11 dBm	±5dB
		9	25 dBm	±3dB	17	9 dBm	±5dB
		10	23 dBm	±3dB	18	7 dBm	±5dB
		11	21 dBm	±3dB	19	5 dBm	±5dB
		12	19 dBm	±3dB			
		DCS1800/PCS1900					
		Level	Power	Toler.	Level	Power	Toler.
		0	30 dBm	±2dB	8	14 dBm	±3dB
		1	28 dBm	±3dB	9	12 dBm	±4dB
		2	26 dBm	±3dB	10	10 dBm	±4dB
		3	24 dBm	±3dB	11	8 dBm	±4dB
		4	22 dBm	±3dB	12	6 dBm	±4dB
		5	20 dBm	±3dB	13	4 dBm	±4dB
		6	18 dBm	±3dB	14	2 dBm	±5dB
		7	16 dBm	±3dB	15	0 dBm	±5dB

5	Output RF Spectrum (due to modulation)	GSM850/EGSM	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600 ~ 1,200	-60
		1,200 ~ 1,800	-60
		1,800 ~ 3,000	-63
		3,000 ~ 6,000	-65
		6,000	-71
		DCS1800/PCS1900	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600 ~ 1,200	-60
		1,200 ~ 1,800	-60
		1,800 ~ 3,000	-65
		3,000 ~ 6,000	-65
		6,000	-73
6	Output RF Spectrum (due to switching transient)	GSM850/EGSM	
		Offset from Carrier (kHz)	Max. (dBm)
		400	-19
		600	-21
		1,200	-21
		1,800	-24
		DCS1800/PCS1900	
		Offset from Carrier (kHz)	Max. (dBm)
		400	-22
		600	-24
		1,200	-24
		1,800	-27

LGE Internal Use Only

7	Spurious Emissions	Conduction, Emission Status Conduction, Emission Status		

8	Bit Error Ratio	GSM850 / EGSM
		
		   BER (Class II) < 2.439% @-102dBm
		 DCS1800/PCS1900
		
		   BER (Class II) < 2.439% @-100dBm		

9	Rx Level Report accuracy	$\pm$ 3 dB		
10	SLR	8 $\pm$ 3 dB		
11	Sending Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	/
		200	0	/
		300	0	-12
		1,000	0	-6
		2,000	4	-6
		3,000	4	-6
		3,400	4	-9
		4,000	0	/
12	RLR	2 $\pm$ 3 dB		
13	Receiving Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	/
		200	0	/
		300	2	-7
		500	*	-5
		1,000	0	-5
		3,000	2	-5
		3,400	2	-10
		4,000	2	
		* Mean that Adopt a straight line in between 300 Hz and 1,000 Hz to be Max. level in the range.		
14	STMR	13 $\pm$ 5 dB		
15	Stability Margin	> 6 dB		

16	Distortion	dB to ARL (dB)		Level Ratio (dB)
		-35		17.5
		-30		22.5
		-20		30.7
		-10		33.3
		0		33.7
		7		31.7
		10		25.5
17	Side tone Distortion	Three stage distortion < 10%		
18	<Change> System frequency (26 MHz) tolerance	$\leq$ 2.5 ppm		
19	<Change>32.768KHz tolerance	$\leq$ 30ppm		
20	Power consumption	Standby - Normal, $\leq$ 3 mA(@PP9)		
21	Talk Time	EGSM/Lvl 7 (Battery Capacity 800mA):180 min EGSM/Lvl12(Battery Capacity 800 mA):320min		
22	Standby Time	Under conditions, at least 300 hours: 1. Brand new and full 900mAh battery 2. Full charge, no receive/send and keep GSM in idle mode. 3. Broadcast set off. 4. Signal strength display set at 3 level above. 5. Backlight of phone set off.		
23	Ringer Volume	At least 65 dB under below conditions: 1. Ringer set as ringer. 2. Test distance set as 50 cm		
24	Charge Current	Fast Charge : < 650 mA Slow Charge: < 120 mA		

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25	Antenna Display	Antenna Bar Number	Power
		7	>-92 dBm ~
		5	-97dBm ~ –93dBm
		4	-100dBm ~ –98dBm
		2	-103dBm ~ –101dBm
		1	-105dBm ~ –104dBm
		0	< –106 dBm
		Off	No Service
26	Battery Indicator	Battery Bar Number	Voltage (±0.05V)
		3	3.72V~4.2V
		2	3.65V~3.71V
		1	3.59V~3.64V
		0	3.35V~3.58V
27	Low Voltage Warning	3.59V↓±0.05V (Call)	
		3.59V↓±0.05V (Standby)	
28	Forced shut down Voltage	3.35 ± 0.05 V	
29	Battery Type	Li-ion Battery Standard Voltage = 3.7 V Battery full charge voltage = 4.2 V Capacity: 900mAh	
30	Travel Charger	Switching-mode charger Input: 150 ~ 240 V, 50/60Hz Out put: 5.1, 0.7A	

* EDGE RF Specification (Option: is not serviced for "EDGE mode")

Item	Description	Specification					
1	RMS EVM	≤9%					
2	Peak EVM	≤30%					
3	95th Percentile EVM	≤15%					
4	Origin Offset Suppression	≥30dB					
5	Power Level	**GSM900/EGSM**					
		Level	Power	Toler.	Level	Power	Toler.
		5	27dBm	±3dB	13	17dBm	±3dB
		6	27dBm	±3dB	14	15dBm	±3dB
		7	27dBm	±3dB	15	13dBm	±3dB
		8	27dBm	±3dB	16	11dBm	±5dB
		9	25dBm	±3dB	17	9dBm	±5dB
		10	23dBm	±3dB	18	7dBm	±5dB
		11	21dBm	±3dB	19	5dBm	±5dB
		12	19dBm	±3dB			
		DCS1800, PCS1900					
		Level	Power	Toler.	Level	Power	Toler.
		0	26/25dBm	±3dB	8	14dBm	±3dB
		1	26/25dBm	±3dB	9	12dBm	±4dB
		2	26/25dBm	±3dB	10	10dBm	±4dB
		3	24dBm	±3dB	11	8dBm	±4dB
		4	22dBm	±3dB	12	6dBm	±4dB
		5	20dBm	±3dB	13	4dBm	±4dB
		6	18dBm	±3dB	14	2dBm	±5dB
		7	16dBm	±3dB	15	0dBm	±5dB
6	Output RF Spectrum (due to modulation)	**GSM900/EGSM**					
		Offset from carrier(kHz)		Max. dBc			
		100		+0.5			
		200		-30			
		250		-33			
		400		-54			
		600~<1,200		-60			
		1,200~<1,800		-60			
		1,800~<3,000		-63			
		3,000~<6,000		-65			
		6,000		-71			

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		DCS1800, PCS1900	
6		Offset from carrier(kHz)	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-54
		600~<1,200	-60
		1,200~<1,800	-60
		1,800~<3,000	-63
		3,000~<6,000	-65
		6,000	-71
7	Output RF Spectrum (due to switching transient)	GSM900/EGSM	
		Offset from carrier(kHz)	Max. dBm
		400	-23
		600	-26
		1,200	-27
		1,800	-30
		DCS1800, PCS1900	
		Offset from carrier(kHz)	Max. dBm
		400	-23
		600	-26
		1,200	-27
		1,800	-30

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3.1. GS290 Functional Block diagram.

The functional component arrangement is mentioned below diagram.
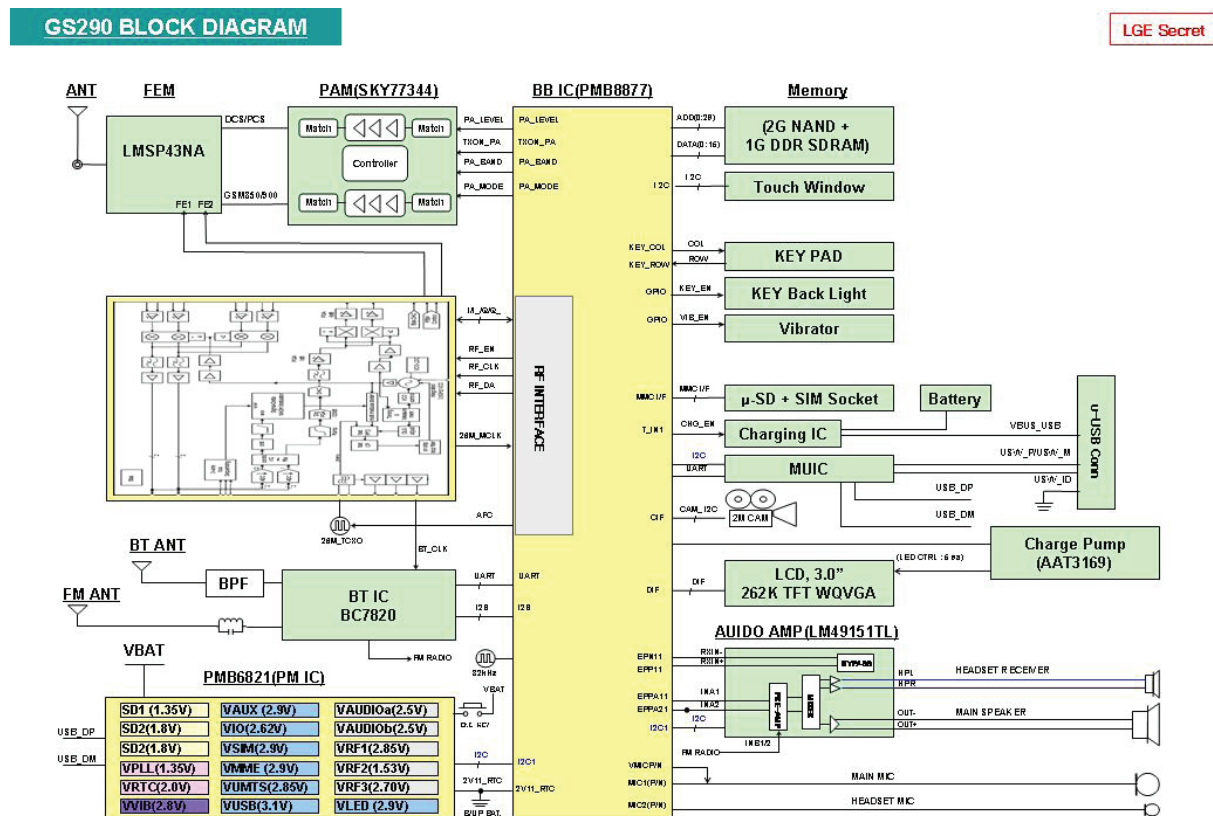
Figure 1 GS290 Functional block diagram

3. TECHNICAL BRIEF

3.2. Baseband Processor (BBP) Introduction
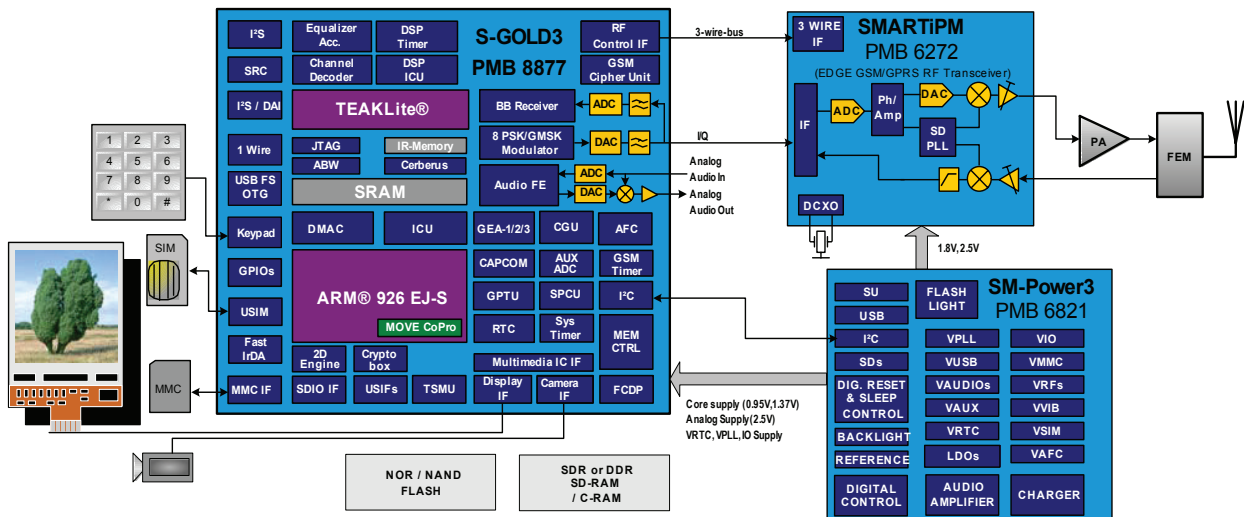
Figure 2 Top level block diagram of the S-GOLD3™ (PMB8877)

3.2.1. General Description

S-GOLD3™ is a GSM/EDGE single chip mixed signal Baseband IC containing all analog and digital functionality of a cellular radio. Additionally S-GOLD3™ Provides multimedia extensions such as camera, software MIDI, MP3 sound. It is designed as a single chip solution, integrating the digital and mixed signal portions of the base band in 0.09um, 1.2V technology.

The chip will fully support the FR, EFR, HR and AMR-NB vocoding.

S-GOLD3™ support multi-slot operation modes HSCSD (up to class 10), GPRS for high speed data application (up to class 12) and EGPRS (up to class 12) without additional external hardware.

3.2.2. Block Description

- **Processing core**

  ARM926EJ-S 32 bit processor core for controller functions. The ARM926EJ-S includes an MMU, and the Jazelle Java extension for Java acceleration.

  - TEAKLite DSP core

- **ARM-Memory**

  - 32k Byte Boot ROM on the AHB
  - 96k Byte SRAM on the AHB, flexibly usable as program or data RAM
  - 16k Byte Cache for Program (internal)
  - 8k Byte tightly coupled memory for Program(internal)
  - 8k Byte Cache for Data(internal)
  - 8k Byte tightly coupled memory for Data(internal)

- **DSP-Memory**

  - 104K x 16bit Program ROM
  - 8k x 16bit Program RAM
  - 60k x 16bit Data ROM
  - 37k x 16bit Data RAM
  - Incremental Redundancy(IR) Memory of 35904 words of 16bit

- **Shared Memory Block**

  1.5K x 32bit Shared RAM(dual ported) between controller system and TEAKLite.

- **Controller Bus system**

  The processor cores and their peripherals are connected by powerful buses.

  Multi-layer AHB for connecting the ARM and the other master capable building blocks with the internal and external memories and with the peripheral buses.

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- **Clock system**

  The clock system allows widely independent selection of frequencies for the essential parts of the S-GOLD3. Thus power consumption and performance can be optimized for each application.

- **Functional Hardware block**

  - CPU and DSP Timers
  - MOVE coprocessor performing motion estimation for video encoding algorithms (H.263, MPEG-4)
  - Programmable PLL with additional phase shifters for system clock generation
  - GSM Timer Module that off-loads the CPU from radio channel timing
  - GMSK / 8-PSK Modulator according to GSM-standard 05.04 (5/2000)
  - GMSK Modulator: gauss-filter with B*T=0.3
  - EDGE Modulator: 8PSK-modulation with linearized GMSK-Pulse-Filter
  - Hardware accelerators for equalizer and channel decoding.
  - Incremental Redundancy memory for EDGE class 12 support
  - A5/1, A5/2, A5/3 Cipher unit
  - GEA1, GEA2, GEA3 Cipher Unit to support GPRS data transmission
  - Advanced static and dynamic power management features including TDMA-Frame synchronous low power mode and enhanced CPU modes(idle and sleep modes)
  - Pulse Number Modulation output for Automatic Frequency Correction(AFC)
  - Serial RF Control interface: support of direct conversion RF
  - A Universal Serial Interface(USIF) enabling asynchronous (UART) of synchronous (SPI) serial data transmission
  - 3 USIF with autobaud detection, hardware flow control and integrated
  - A dedicated Fas IfDA Controller supporting IrDA's SIR,MIR and FIR standards (up to 4Mbps)
  - I2C-bus interface (e.g. connection to S/M power)
  - A fast display interface supporting serial and parallel interconnection
  - An ITU-R BT.656 compatible Camera interface.
  - Programmable clock output for a camera
  - An multimedia/Secure Digital Card Interface (MMCI/SD:SDIO capable)

3.2.3. External Devices connected to memory interface

Table 1. Memory interface

Device	Name	Maker	Remark
FLASH	K522H1HACB-B060	SAMSUNG	Synchronous / A synchronous
DDR	K522H1HACB-B060	SAMSUNG	Synchronous 166MHz
LCD	IM300IBN1A	LGIT	8bit access 2 times transmission
Melody IC	Not Used	S/W	Infineon Software CODEC

3.2.4. RF Interface (T_OUT)

S-Gold3 uses this interface to control RF IC and Peripherals. 13 signals are provided switch on/off RF ICs Periodically each TDMA frame.

Table 2. RF Interface Spec.

T_OUT		
Resource	**Interconnection**	**Description**
T_OUT0	TXON_PA	PAM Power on
T_OUT1	N/A	N/A
T_OUT2	PA_BAND	TX RF band select
T_OUT3	N/A	N/A
T_OUT4	N/A	N/A
T_OUT5	Other function	-
T_OUT6	PA MODE	PAM Mode select

3.2.5. USIF Interface

GS290 have three USIF Drivers as follow :

- USIF1 : Hardware Flow Control / SW upgrade / Calibration

- USIF2 : Not used Rx, Tx and CTS, RTS use BT Interface

- USIF3 : BT Interface

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Table 3. USIF Interface Spec.

Resource	Name	Remark
USIF1		
USIF1_TXD	TXD	Transmit Data
USIF1_RXD	RXD	Receive Data
USIF1_CTS	USB_DP	
USIF1_RTS	USB_DM	
USIF2		
USIF2_TXD	NC	NC
USIF2_RXD	Other function	-
USIF2_CTS	BT_CTS	
USIF2_RTS	BT_RTS.	
USIF3		
USIF3_TXD	BT_TX	BT Transmit tx
USIF3_RXD	BT_RX	BT Receive rx

3.2.6. ADC channel

BBP ADC block is composed of 10 external ADC channel. This block operates charging process and other related process by reading battery voltage and other analog values.

Table 4. S-Gold3 ADC channel usage

ADC channel		
Resource	**Interconnection**	**Description**
M0	BAT_ID	Battery temperature measure
M1	RF_TEMP	RF block temperature measure
M2	N.C	
M3	N.C	
M4	N.C	
M5	N.C	
M6	N.C	
M7	N.C	
M8	VSUPPLY	Battery supply voltage measure
M9	N.C	
M10	N.C	

3.2.7. GPIO map

Over a hundred allowable resources, GS290 is using as follows except dedicated to SIM and Memory. GS290 GPIO(General Purpose Input/Output) Map, describing application, I/O state, and enable level, is shown in below table

Table 5 S-Gold3 GPIO pin Map

Port Function	Net Name	Description
KEY MATRIX		
KP_IN0		
KP_IN1		
KP_IN2		
KP_IN3	KP_IN(3)	
KP_IN4		
KP_IN5	KP_IN(5)	
KP_IN6	KP_IN(6)	
KP_OUT0	BT_HOST_WAKEUP	
KP_OUT1	KP_OUT(0)	
KP_OUT2	KP_OUT(2)	
KP_OUT3	KP_OUT(3)	
USIF1		
USIF1_RXD	UART_RX	UART, RS232 Data
USIF1_TXD	UART_TX	UART, RS232 Data
USIF1_RTS_N	USB_DAT_VP	USB Data
USIF1_CTS_N	USB_SE0_VM	USB Data
USIF2		
USIF2 _RXD	USW_INT	MUIC Interrupt Singnal
USIF2 _TXD	NA	Not used
USIF2_RTS_N	UART_BT_RTS	Bluetooth RTS
USIF2_CTS_N	UART_BT_CTS	Bluetooth CTS
USIF3		
USIF3 _RXD	UART_BT_RX	Bluetooth RX
USIF3 _TXD	UART_BT_TX	Bluetooth TX
CLK		
CLK32K	CLK32k	For FM Radio, BT CLK32K
GPIO_22		Not used
CAMERA I/F		

3. TECHNICAL BRIEF

CIF_D0	CIF_D(0)	Camera DATA[0]
CIF_D1	CIF_D(1)	Camera DATA[1]
CIF_D2	CIF_D(2)	Camera DATA[2]
CIF_D3	CIF_D(3)	Camera DATA[3]
CIF_D4	CIF_D(4)	Camera DATA[4]
CIF_D5	CIF_D(5)	Camera DATA[5]
CIF_D6	CIF_D(6)	Camera DATA[6]
CIF_D7	CIF_D(7)	Camera DATA[7]
CIF_PCLK	CIF_PCLK	Camera pixel clock
CIF_HSYNC	CIF_HS	Camera H sync
CIF_VSYNC	CIF_VS	Camera V sync
CLKOUT	CIF_MCLK	Camera main clock
CIF_PD	CIF_PD	Camera power down(active high)
CIF_RESET	CIF_RESET	Camera reset
LCD I/F		
DIF_D0	DIF_D(0)	LCD data[0]
DIF_D1	DIF_D(1)	LCD data[1]
DIF_D2	DIF_D(2)	LCD data[2]
DIF_D3	DIF_D(3)	LCD data[3]
DIF_D4	DIF_D(4)	LCD data[4]
DIF_D5	DIF_D(5)	LCD data[5]
DIF_D6	DIF_D(6)	LCD data[6]
DIF_D7	DIF_D(7)	LCD data[7]
DIF_D8	DIF_D(8)	LCD data[8]
DIF_CS1	DIF_MAIN_CS	MAIN LCD chip select
DIF_CS2	IF_MODE	LCD Interface mode
DIF_CD	DIF_CD	Command Data switch
DIF_WR	DIF_WR	LCD Write
EINT7	HOOK_DETECT	Ear-Mic hook detection
DIF_RESET1	_DIF_RESET	LCD Reset
GPIO_108	VIB_EN	Vibrator enable
I2C		
I2C_SCL	I2C_SCL	For PMIC/Amp/Touch/MUIC
I2C_SDA	I2C_SDA	For PMIC/Amp/Touch/MUIC
PM_INT (EINT)	PM_INT	

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SIM I/F		
CC_IO	SIM_IO	SIM CARD I/O
CC_CLK	SIM_CLK	SIM CARD CLOCK
CC_RST	SIM_RST	SIM CARD RESET
I2S2		
I2S2_CLK0		Not used
GPIO_102	LCD ID	LCO Bender Check
I2S2_RX		Not used
I2S2_TX		Not used
I2S2_WA0		Not used
GPIO_103		Not used
External Memory		
MMCI_CMD	TF_CMD	T-flash
MMCI_DAT[0]	TF_DAT0	T-flash
MMCI_CLK	TF_CLK	T-flash
GPIO_109	CAM_LDO_EN	Camera Power LDO Control
IrDA		
GPIO_110		
GPIO_109		
I2S1		
I2S1_CLK0	BT_PCM_CLK	For Bluetooth
I2S1_CLK1	MMC_DETECT	T-flash Detect
I2S1_RX	I2S1_RX	For Bluetooth
I2S1_TX	I2S1_TX	For Bluetooth
I2S1_WA0	I2S1_WA	For Bluetooth
External Memory		
MMCI_DAT[1]	TF_DAT1	T-flash
MMCI_DAT[2]	TF_DAT2	T-flash
MMCI_DAT[3]	TF_DAT3	T-flash
Audio I/F		
EPN1	EAR_N	For Receiver
EPP1	EAR_P	For Receiver
EPPA1	BBP_SND_L	For Speaker
EPREF		Reference

EPPA2	BBP_SND_R	For Speaker
MICN1	MIC1_N	For Mic
MICP1	MIC1_P	For Mic
MICN2	MIC2_N	For Headset Mic
MICP2	MIC2_P	For Headset Mic
VMICP	VMICP	Power for MIC
VMICN	VMICN	Power for MIC
ADC		
M0	BAT_ID	Battery temperature measure
M1	RF_TEMP	RF block temperature measure
M2		
M3		
M7		
M8	VSUPPLY	Battery supply voltage measure
M9		
M10		
Reference		
VREF		
IREF		
JTAG I/F		
TDO	TDO	JTAG
TDI	TDI	JTAG
TMS	TMS	JTAG
TCK	TCK	JTAG
TRST_n	_TRST	JTAG
RTCK	RTCK	JTAG
ETM I/F		
TRIG_IN	TRIG_IN	ETM (Embedded Trace Macro Cell)
MON1	MON1	ETM
MON2	MON2	ETM
TRACESYNC	TRACESYNC	ETM
TRACECLK	TRACECLK	ETM
PIPESTAT[2]	PIPESTAT2	ETM
PIPESTAT[1]	PIPESTAT1	ETM
PIPESTAT[0]	PIPESTAT0	ETM

TRACEPKT[0]	TRACEPKT(0)	ETM
TRACEPKT[1]	TRACEPKT(1)	ETM
TRACEPKT[2]	TRACEPKT(2)	ETM
TRACEPKT[3]	TRACEPKT(3)	ETM
TRACEPKT[4]	TRACEPKT(4)	ETM
TRACEPKT[5]	TRACEPKT(5)	ETM
TRACEPKT[6]	TRACEPKT(6)	ETM
TRACEPKT[7]	TRACEPKT(7)	ETM
Memory		
MEM_AD[0]	DATA(0)	
MEM _AD[1]	DATA (1)	
MEM _AD[2]	DATA (2)	
MEM _AD[3]	DATA D(3)	
MEM _AD[4]	DATA (4)	
MEM _AD[5]	DATA (5)	
MEM _AD[6]	DATA (6)	
MEM _AD[7]	DATA (7)	
MEM _AD[8]	DATA (8)	
MEM _AD[9]	DATA (9)	
MEM _AD[10]	DATA (10)	
MEM _AD[11]	DATA (11)	
MEM _AD[12]	DATA (12)	
MEM _AD[13]	DATA (13)	
MEM _AD[14]	DATA (14)	
MEM _AD[15]	DATA (15)	
MEM _WR_n	_WR	
MEM _RD_n	_RD	
MEM _BC0_n	_BC0	
MEM _BC1_n	_BC1	
MEM _A[0]	ADD(0)	
MEM _A[1]	ADD (1)	
MEM _A[2]	ADD (2)	
MEM _A[3]	ADD (3)	
MEM _A[4]	ADD (4)	
MEM _A[5]	ADD (5)	

LGE Internal Use Only

MEM _A[6]	ADD (6)	
MEM _A[7]	ADD (7)	
MEM _A[8]	ADD (8)	
MEM _A[9]	ADD (9)	
MEM _A[10]	ADD (10)	
MEM _A[11]	ADD (11)	
MEM _A[12]	ADD (12)	
MEM _A[13]	ADD (13)	
MEM _A[14]	ADD (14)	
MEM _A[15]	ADD (15)	
MEM _A[16]	ADD (16)	
MEM _A[17]	ADD (17)	
MEM _A[18]	ADD (18)	
MEM _A[19]	ADD (19)	
MEM _A[20]	ADD (20)	
MEM _A[21]	ADD (21)	
MEM _A[22]	ADD (22)	
MEM _A[23]	ADD (23)	
MEM _A[24]	ADD (24)	
MEM_A[25]	ADD(25)	
MEM_A[26]	ADD(26)	
MEM_CSA0_n	ADD(27)	
MEM_CSA1_n	ADD(28)	
MEM_CSA2_n	ADD(29)	
MEM _RAS_n	_RAS	
MEM _CAS_n	_CAS	
MEM _WAIT_n	_WAIT	
MEM _SDCLKO	SDCLKO	For Burst mode
MEM _SDCLKI	SDCLKI	For Burst mode
MEM _BFCLKO	BFCLKO	For Burst mode
MEM _BFCLKI	BFCLKI	For Burst mode
MEM _CKE	CKE	
Memory		
FCDP_RBn	FCDP	
TDMA I/F		

T_OUT0	TXON_PA	PAM
GPIO_108	VIB_EN	
T_OUT2	PA_BAND	PAM
T_OUT3	FE1	
T_OUT4	BT_WAKEUP	
T_OUT5	LIN_PWM_MAG	
T_OUT6	PA_MODE	PAM
T_OUT7	LIN_PWM_FRQ	
CC1CC7IO	JACK_DETECT	
GPIO_52	LCD_BACKLIGHT	LCD Backlight control
GPIO_102	LCD_ID	LCD ID check
GPIO_54		
RF I/F		
RF_STR0	RF_EN	
CC1CC5IO	_PPR	For Charger
RF_DATA	RF_DA	
RF_CLK	RF_CLK	
System Port		
AFC	AFC	
CLKOUT0 [<=26MHz]		Not used
F26M	26MHZ_MCLK	26M Main Clock
F32K		to 32k crystal
OSC32K		to 32k crystal
RESET_n	_RESET	
TRIG_OUT	TRIG_OUT	
RTC_OUT	RTC_OUT	
VCXO_EN	VCXO_EN	
DSP		
GPIO_61		
GPIO_62		
GPIO_63		

3.3. Power management IC

3.3.1. General Description

SM-POWER is a highly integrated Power and Battery Management IC for mobile handsets. It has been specially designed for usage with S-Gold3. Although optimized for usage with the Infineon S-GOLD baseband device it is suitable for the S-GOLDlite and the E-GOLD+ baseband devices as well. It also supports the cellular RF devices like SMARTi-DC, SMARTi-DC+, SMARTi-SD and the Bluemoon Single, Infineon's single chip solution for Bluetooth. If used with S-GOLD3 it provides all power supply functions (except for the RF PA) for a complete advanced GSM Edge smart phone minimizing external device count.

Block Description

• Highly efficient step-down converter for main digital baseband supply including Core, DSP and memory interface (External Bus Unit).
• Support of S-GOLD standby power-down concept
• Low-drop-out (LDO) regulators for Flash and mobile RAM memory devices
• Voltage independent switching of two SIM cards
• LDO regulators for baseband I/O supply
• LDO regulator for analog mixed-signal section of S-GOLD
• Low-noise LDO regulators for RF devices
• Supply for Bluemoon Single, Infineon's single chip solution for Bluetooth
• Audio amplifier 8 Ohms for handsfree operation and ringing
• Charge Control for charging Li-Ion/Polymer batteries under software control
• Pre-charge current generator with selectable current level
• RTC regulator with ultra-low quiescent current
• USB interface support for peripheral and mini-host mode
• Backlight LEDs driver with current selection and PWM dimming function
• Two single LED driver outputs for signaling
• Vibrator driver with adjustable voltage
• Fully controlable by software via I2C – Bus
• Temperature and battery voltage sensors
• Interrupt channels for peripherals
• System debug mode
• VQFN 48 package with heat sink and non-protruding leads
• Compatible with the Infineon E-GOLD+ V2 and V3

SM-POWER is a further step on the successful E-Power product line with enhanced and optimized functionality.

SM-POWER features a baseband supply concept with a DC/DC step-down converter cascaded by two linear regulators

  – SM-POWER's DC/DC converter makes up to 40 % reduction of battery current for smart phone functions (e.g. organizer functions, games, MP3 decoding) possible.

  – SDBB has high efficiency up to 95% and also a power save mode.

  – Memory Interface is directly supported by the SDBB

  – SDBB can also act as main supply voltage for E-GOLD+ or S-GOLDlite baseband devices.

  – For S-GOLD two linear regulators for DSP and Core are cascaded after the SDBB.

SM-POWER supports the standby power-down concept of S-GOLD by temporarily switching off the linear regulator for the DSP during mobile standby whenever this subsystem is not used. In this phase the ARM controller and most peripherals including parts of the on-chip SRAM are kept powered-up with power being supplied by the other linear regulator.

SM-POWER includes a fully differential audio amplifier able to drive loads down to a nominal value of 8 Ohm for usage in hands-free phones and for ringing

  – 450 mW maximum output power

  – adjustable gain

  – mute switch SM-POWER also integrates a charging function for Li-Ion, Li-Polymer batteries

  – click and pop -protection SM-POWER also integrates a charging function for Li-Ion, Li-Polymer batteries

  – Precharge current source with two current levels

  – Constant current / constant voltage charging with 3 different termination voltages

  – Programable charge current limitation for use with different batteries

  – Freely programable pulse charging to reduce the thermal power dissipation in the constant voltage charging phase

  – Top-off charge current sensing SM-POWER completes the USB interface of S-GOLD

  – Regulated voltage for S-GOLD USB interface including reverse current and overvoltage protection

  – Switch to supply USB pull-up resistor

  – Mini-host pull down resistor functionality

  – Charge pump with internal switching capacitor for USB host VBUS supply voltage SM-POWER fully supports LED and Vibra Motor functionality

  – no external components needed

  – driver for backlight LEDs adjustable in steps up to 140mA and with soft turn on and off by PWM dimming

  – two driver outputs for single LEDs for precharge indication and signaling with i.e. change of colour

3. TECHNICAL BRIEF

–driver for Vibra Motor with adjustable voltages, soft startup / shutdown and current limitation

   SM-POWER offers several control functions

   – Power-on Reset Generator with logic state machine

   – I2C bus interface

– I2C bus configurable mode control logic with ON (push-button or RTC), VCXOEN and LRF3EN (wake-up by Bluetooth) inputs

– Programable interrupt channels to handle peripherals like SIM, MMC and USB

– Monitoring of charging functions

– Undervoltage Shut-Down

– Errorflags (volatile or non-volatile) from many power-supply functions and thermal sensor in order to debug system

– Overtemperature Shut-Down

– Overtemperature Warning

– Support of S-GOLD standby power-down concept

– Support of S-GOLD Power-Down Pad Tristate Function

Table 6. LDO Output Table of SM-Power

LDO	Net name	Output Voltage	Output Current	Usage
SD1	1V35_Core	1.35V	600mA	Core & for LDO
SD2	1V8_SD	1.8V	300mA	Memory
VAUX	2V9_VAF	2.9V	100mA	Cam Auto Focus
VIO	2V62_VIO	2.62V	100mA	Peripherals
VSIM	2V9_SIM	2.9V	70mA	SIM card
VMME	2V8_VMME	2.9V	150mA	u-SD
VUMTS	2V85_AMP	2.85V	110mA	Headset AMP
VUSB	VUSB	3.1V	40mA	VUSB
VLED	VLED	2.9V	10mA	Not used
VAUDIOa	2V5_VAUDA	2.5V	200mA	Stereo headset, Mono earpiece
VAUDIOb	2V5_VAUDB	2.5V	50mA	Analog parts of S-Gold
VRF1	2V85_VRF	2.85V	150mA	2.85 V supply for SMARTi-PM RF transceiver
VRF2	1V5_VRF	1,53V	100mA	1.5 V supply for SMARTi-PM RF transceiver
VRF3	2V65_VBT	2.7V	150mA	Bluetooth
VPLL	1V35_VPLL	1.35V	30mA	S-GOLD3 PLL
VRTC	2V11_RTC	2.11V	4mA	Real Time Clock
VAFC	VAFC	2.65V	5mA	Not used
VVIB	2V8_VLCD	2.8V	140mA	LCD

PMIC

Figure 3. SM-Power Circuit Diagram of GS290

Micro USB

Single Charging IC for uUSB

Figure 4   charging part

3. TECHNICAL BRIEF

3.3.2. Charging

The bq25040 has a single power output that charges the battery. A system load can be placed in parallel with the battery.The charge current is programmed using the ISET and EN/SET inputs. The charge current is programmable to USB100, USB500 or a user programmed charge current up to 1.2A. Additionally, a 4.9V +/-3% 50mA LDO is integrated into the IC for supplying low power external circuitry. The one-wire interface (EN/SET) is available to place the bq25040 into Test Jig Mode. In Test Jig Mode, the output is regulated at 4.2V and can be used without a battery.The bq25040 has a single power output that charges the battery.. Either a 1-cell Li-Ion or Li-Ion-Polymer battery with 4.1, 4.2 or 4.4 Volts may be used.

    4.2V~3.74V   3.73V~3.65V   3.65V~3.59V   3.59V~3.35V

Figure 5 Battery Block Indication

1. Charging method : CC-CV
2. Charger detect voltage : 4.8 V
3. Charging time : 2h
4. Charging current   : 645 mA
5. CV voltage : 4.2 V
6. Cutoff current   : 105 mA
7. Full charge indication current (icon stop current) : 110 mA
8. Recharge voltage : 4.16 V
9. Low battery alarm

    a. Stand by : 3.59V↓ ±0.05V

    b. Call : 3.59V↓ ±0.05V

10. Low battery alarm interval

    a. Stand by : 3 min

    b. Dedicated : 1 min

11. Switch-off voltage : 3.35 V

3.4. Power ON/OFF

GS290 Power State : Defined 3cases as follow

▶ Power-ON : Power key detect (SM-Power's ON port)
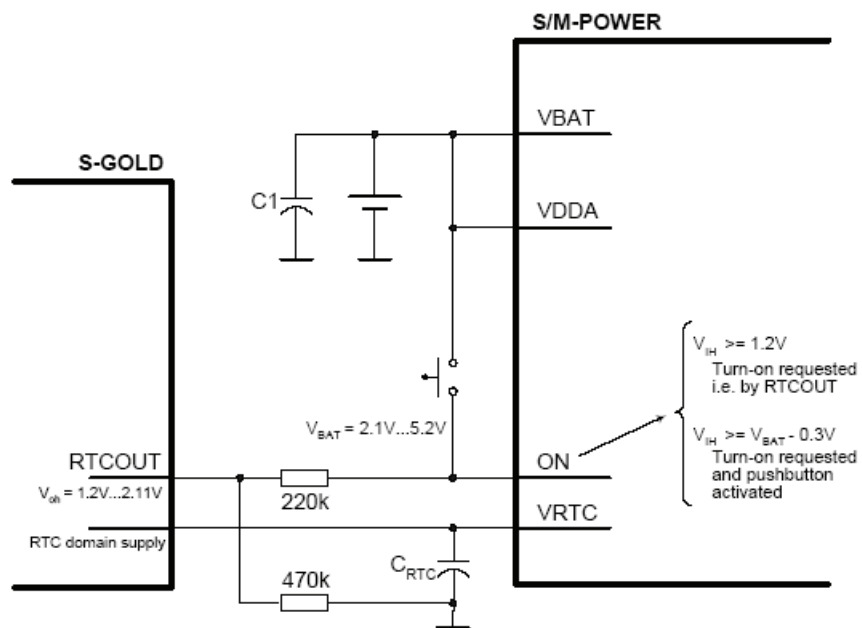
▶ Power-ON-charging : Charger detect.

Figure 6 Power on application.

3. TECHNICAL BRIEF

Input ON is a power-on input for SM-POWER with 2 active high levels (see Figure 6). It might be triggered by a push button or by the RTCOUT output of the S-GOLD device as well. To detect if the push-button is pressed during system operation the logical level at pin ON or its change (if Bit 1 EION in INTCTRL2 is asserted) is recorded in bit LON of the ISF register. If the high level of voltage at pin ON does not reach VIHdet (Vbat-0.8 ~ Vbat-0.3) the above-mentioned bit won't be set.

To support Remote power on function for factory mass production, applied an analog switch as following figure. As monitoring the RPWRON and Key matrix KP_OUT(2) & KP_IN (6), GS290 system recognize whether remote power on or End-key pushed

Power On
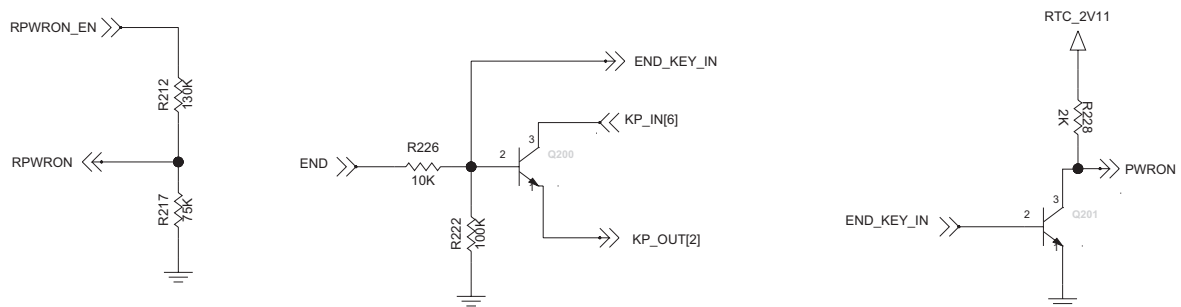
Figure 7 Remote power on and End-key power on circuit

3.5. SIM & uSD interface

GS290 supports 1.8V & 2.9V plug in SIM, SIM interface scheme is shown in (Figure 8).

SIM_IO, SIM_CLK, SIM_RST ports are used to communicate with BBP(S-Gold3) and the SIM power supply enabled by PMIC.

SIM Interface

SIM_CLK : SIM card reference clock

SIM_RST : SIM card Async /sync reset

SIM_IO : SIM card bidirectional reset

SIM CONNECTOR
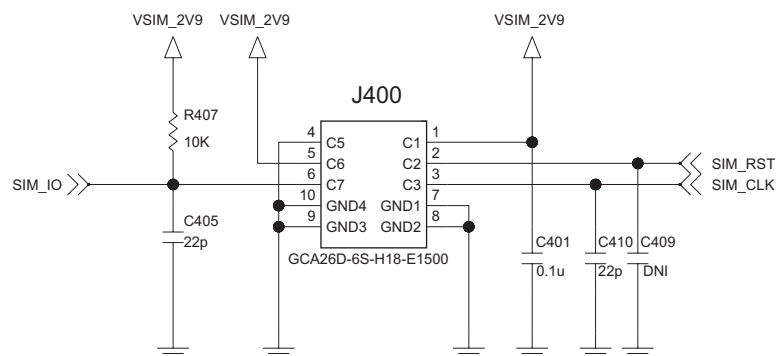
Figure 8 SIM & Micro SD Circuit

3. TECHNICAL BRIEF

The MicroSD Memory Module has eight exposed contacts on one side. The S-Gold3 is connected to the module using a dedicated eight-pin connector
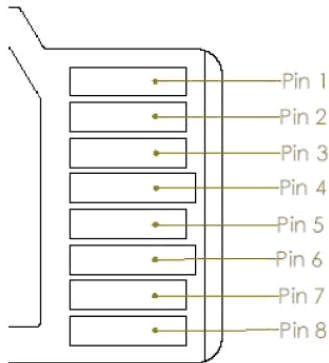
Micro SD Memory Card Detection Scheme

Micro SD memory pad assign.

SD mode			
Pin No.	Name	Type	Description
1	DAT2	I/O	Data bit [2]
2	CD/DAT3	I/O	Data bit [3]
3	CMD	I/O	Command response
4	VDD	Power	Power supply
5	CLK	I	Clock
6	VSS	Ground	Power ground
7	DAT0	I/O	Data bit [0]
8	DAT1	I/O	Data bit [1]

3.6. Memory

2Gbit NAND & 1Gbit DDRSDRAM employed on GS290 with 8 & 16 bit parallel data bus thru ADD(0) ~ ADD(29). The 512Mbit Nand Flash memory with DDRAM stacked device family offers multiple high-performance solutions.

Large Block Memory

(2048Mbit NAND / 1024 Mbit DDR SDRAM, 1.8V I/O)

Figure 9 Flash memory & DDR RAM MCP circuit diagram

3. TECHNICAL BRIEF

3.7. LCD Display

LCD module include:

- Main LCD: 3.0" 240x400 WQVGA, 262K color TFT
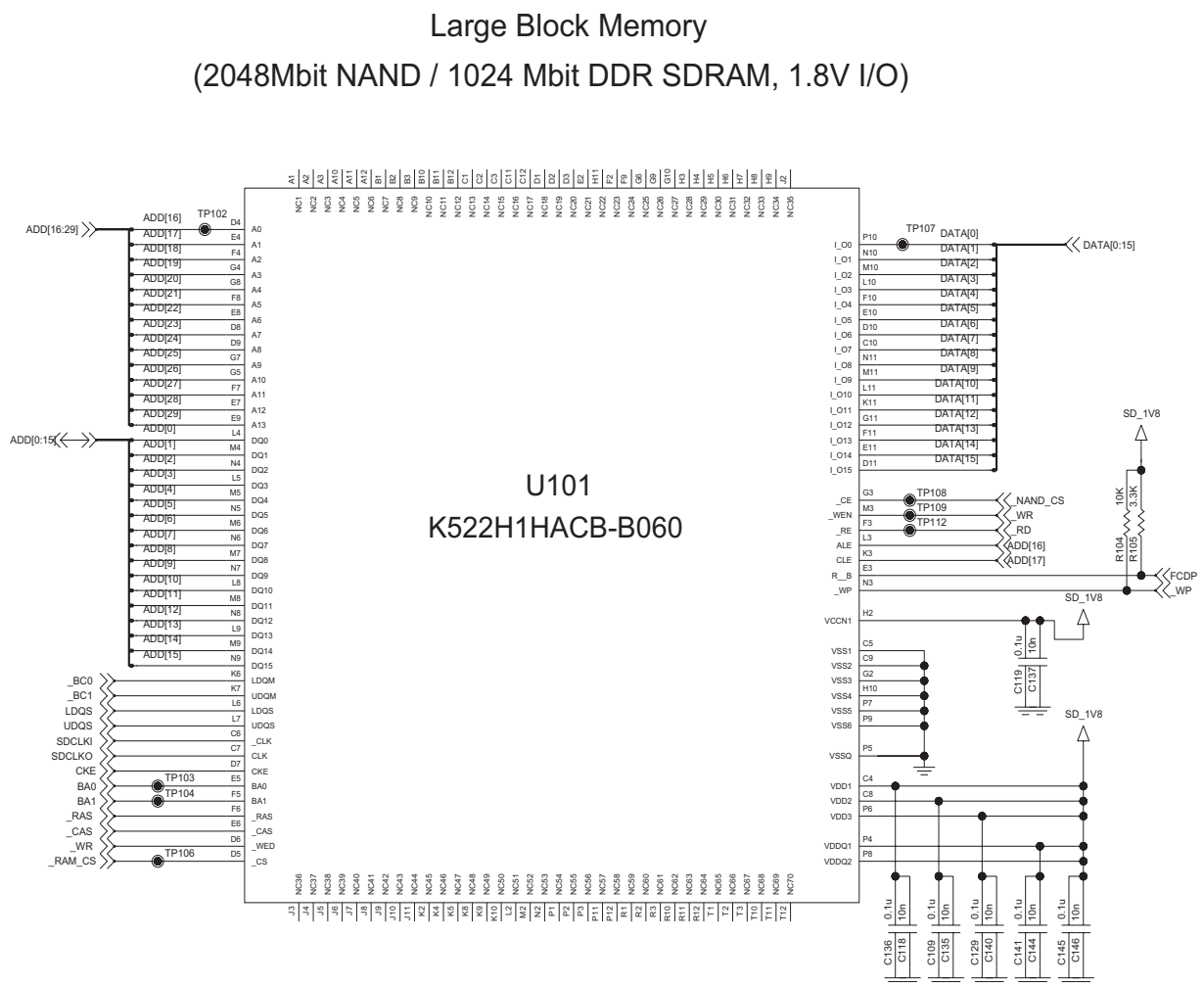
- Backlight : 5 piece of white LED

LCD FPC Interface Spec:

Table 7. LCD FPC Interface Spec.

Pin No	Symbol	Description	I/O	Remarks
1	GND	GND level pin	-	
2	VSYNC_IN	External VSYNC input	-	Unused :connected to VDDIO or GND
3	MARKER_ID	MARKER_ID pin = "LOW(GND)"	-	
4	LEDA	LED1~5 Anode Common	-	
5	LEDC1	LED1 Cathode	-	
6	LEDC2	LED2 Cathode	-	
7	LEDC3	LED3 Cathode	-	
8	LEDC4	LED4 Cathode	-	
9	LEDC5	LED5 Cathode	-	
10	GND	GND level pin	-	
11	IF_MODE_1	Bus width setting	I	Note 1)
12	RS	Data / Command selectable	I	High(VDDIO) : Access to data Low(GND) : Access to Index
13	CS	Chip Select	I	Low(GND) enable
14	RESETB	Reset enable	I	Low(GND) enable
15	RD	Read enable	I	Low(GND) enable
16	WR	Write enable	I	Low(GND) enable
17	VSYNC_O	Tearing Effect Output	O	
18	OPEN(OTP)	(OTP Program pin)	I	Don't care (open)
19	IF_MODE_0	Bus width setting	I	Note 1)
20	GND	GND level pin	-	
21	GND	GND level pin	-	
22	D15	Data Bus	I/O	
23	D14	Data Bus	I/O	
24	D13	Data Bus	I/O	
25	D12	Data Bus	I/O	
26	D11	Data Bus	I/O	
27	D10	Data Bus	I/O	
28	D9	Data Bus	I/O	
29	D8	Data Bus	I/O	
30	D7	Data Bus	I/O	
31	D6	Data Bus	I/O	
32	D5	Data Bus	I/O	
33	D4	Data Bus	I/O	
34	D3	Data Bus	I/O	
35	D2	Data Bus	I/O	
36	D1	Data Bus	I/O	
37	D0	Data Bus	I/O	
38	VCC	Power supply for analog	-	
39	VDDIO	Power supply for I/O	-	
40	GND	GND level pin	-	

3.8. Keypad Switching & Scanning

The keypad interface is a peripheral which can be used for scanning keypads up to 3 rows (outputs from Port Control Logic) and 2columns (inputs to PCL). The number of rows and columns depend on settings of the PCL.

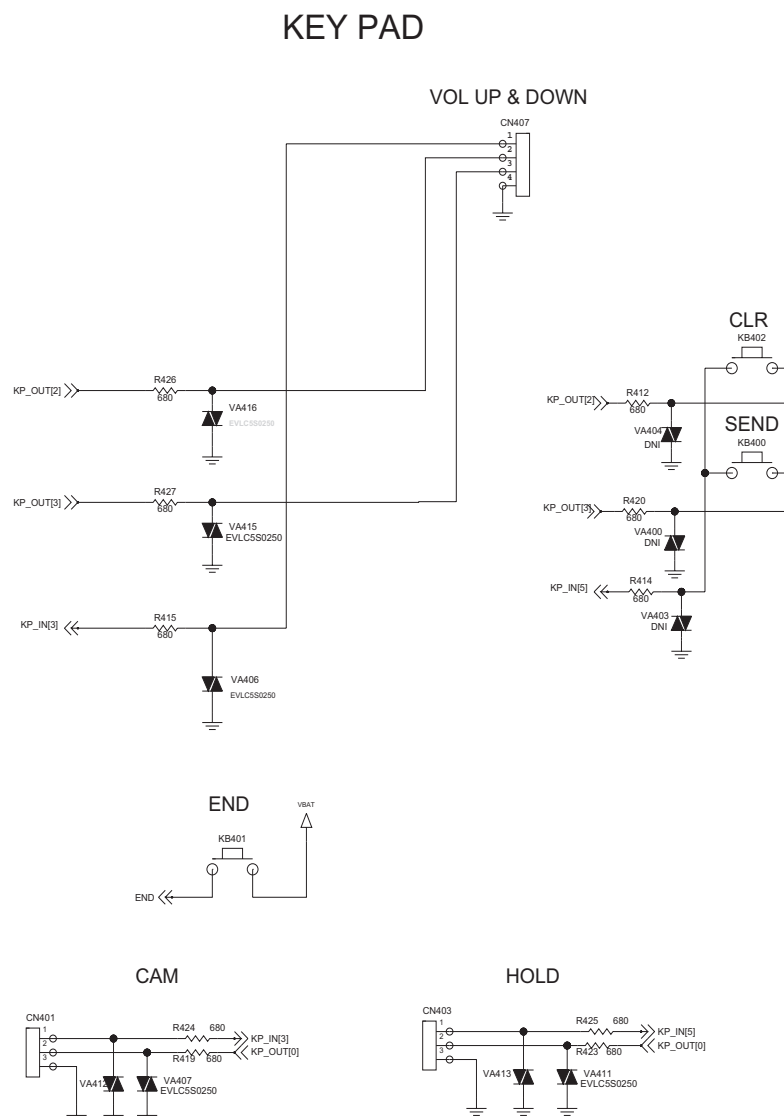**Figure 10 Key pad part key matrix**

3.9. Keypad back-light illumination

There are 2 snow white color LEDs on Key FPCB for keypad illumination. Keypad Back-light is controlled by SM-Power Flash LED port which has constant current control function. The whole configuration of the SM-POWER Flash LED drivers is shown in below Figure11.
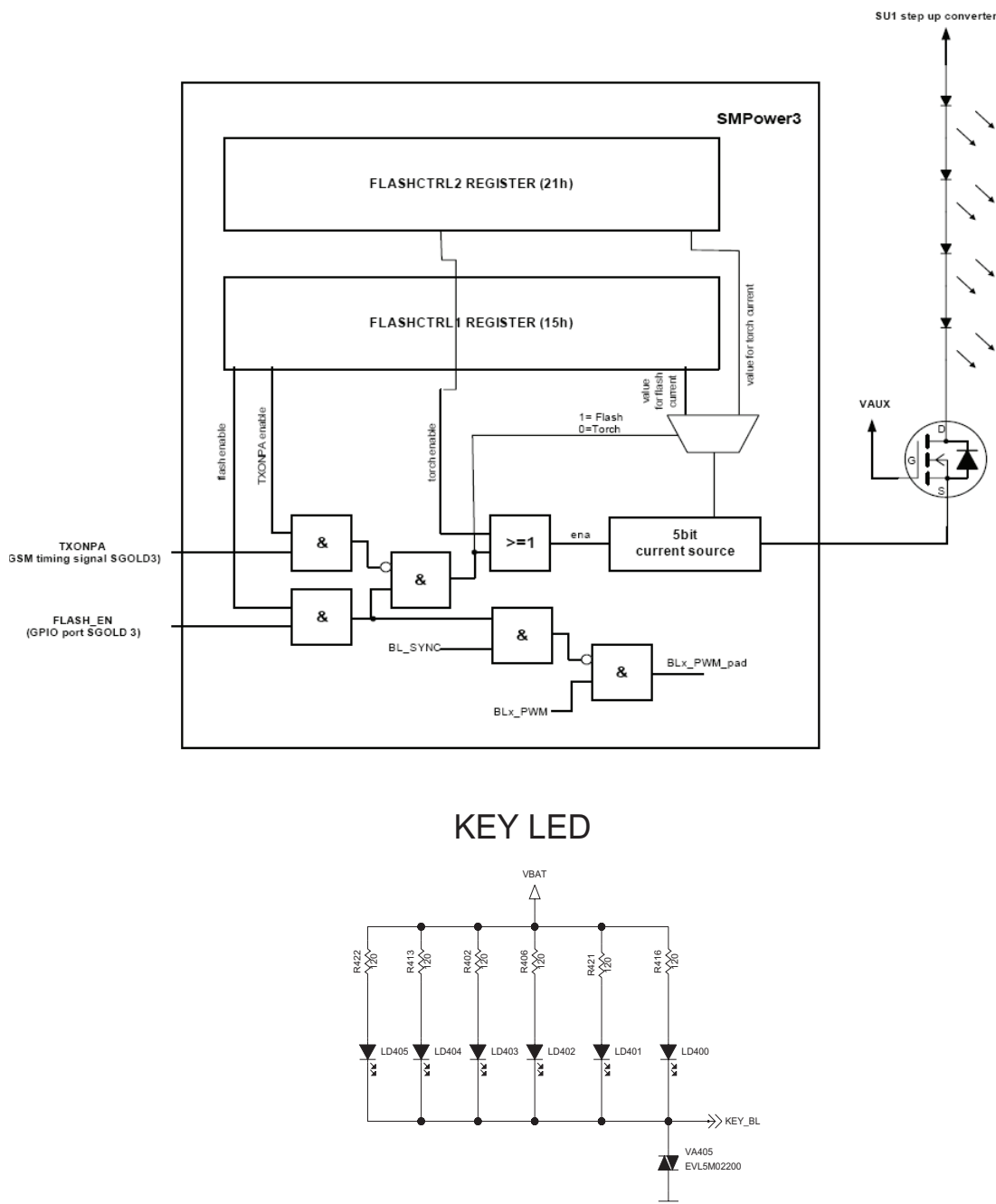

Figure 11 Keypad Back-light LEDs

3.10. LCD back-light illumination

LCD Backlight
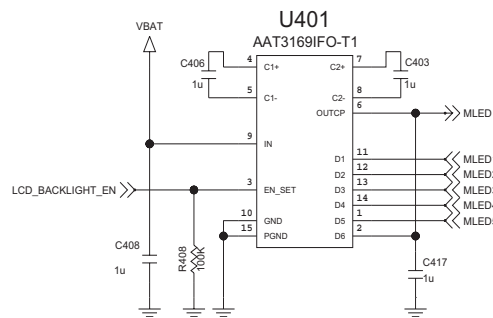
Figure 12 LCD Back light unit and Flash LED charge pump IC

The AAT3169 is a write-only single wire interface. It provides access to up to 32 registers that control device functionality.In this system, two sets of pulse trains are transmitted via the SPIF pin. The first pulse set is used to set the desired address. After the bus is held high for the address hold period, the next pulse set is used to write the data value. After the data pulses are transmitted the bus is held high again for the data hold period to signify the data write is complete. At this point the slave device latches the data into the address that was selected by the first set of pulses. The protocol for using this interface is described in the following subsection.
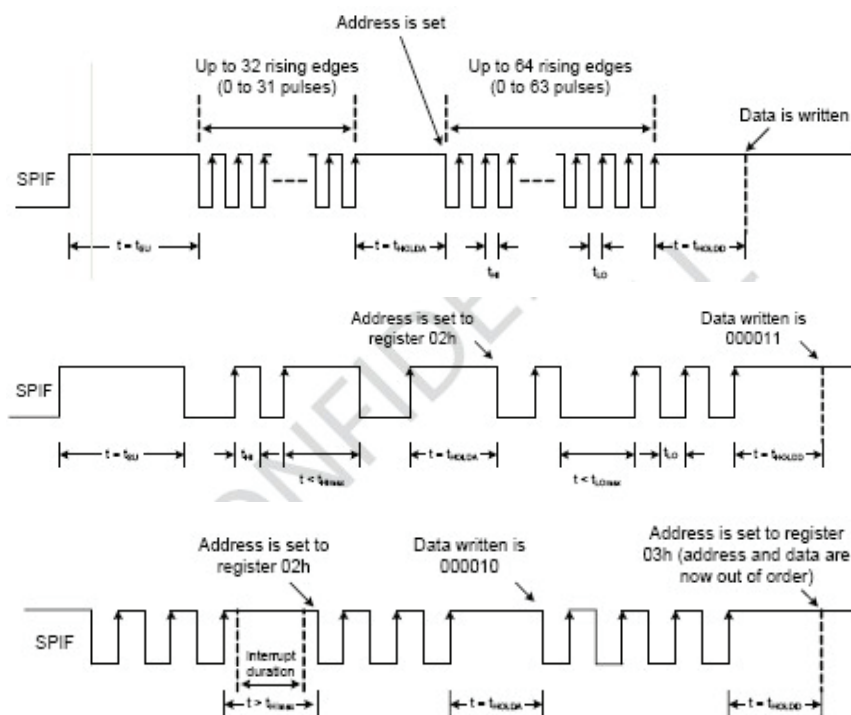
Figure 13 I2C Serial data port control method

3.11. Audio

GS290 Audio signal flow diagram as following diagram.
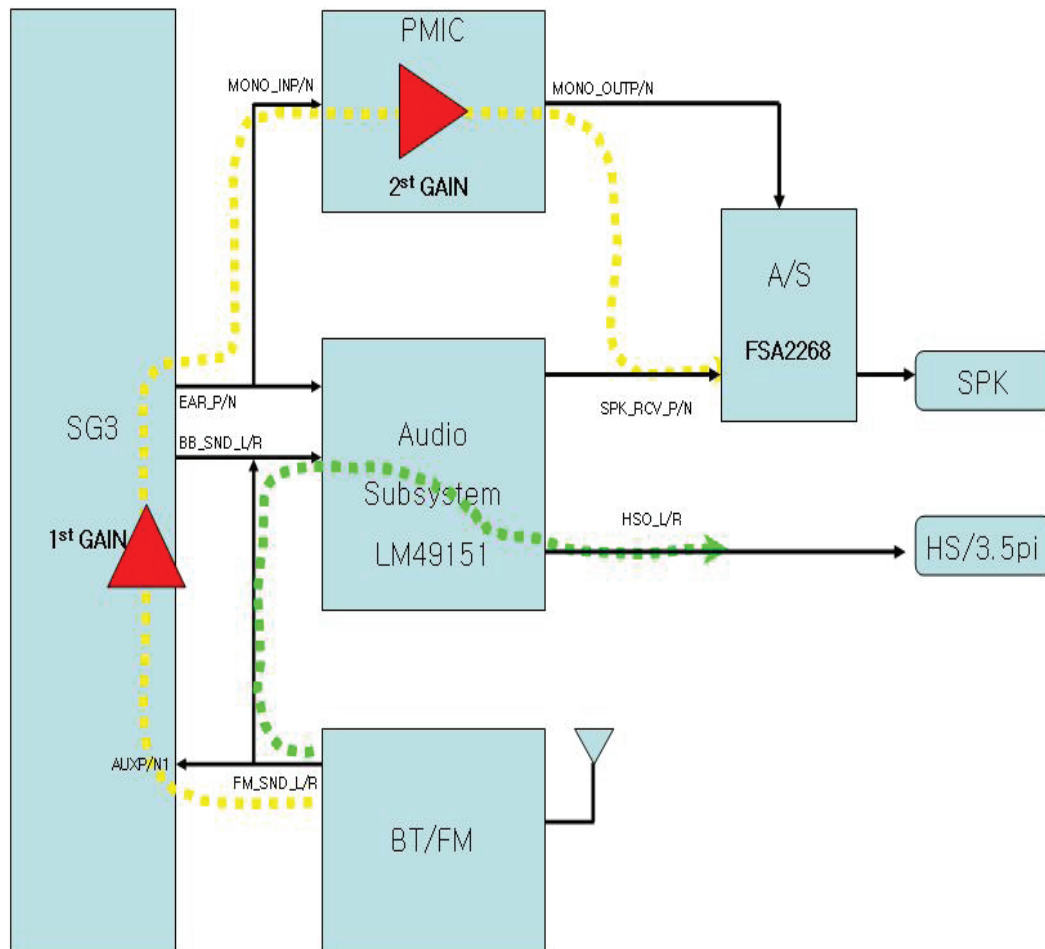
Figure 14 Audio signal flow diagram

3.12.1. Audio amplifier

Audio amplifier sub system IC is an audio power amplifier capable of delivering 1.25W of continuous average power into a mono 8Ω load, 42mW per channel of continuous average power into stereo 32Ω single-ended (SE) loads. The LM49151 features digital volume control and ten distinct output modes. The digital volume control, output modes (mono/SE/OCL) are programmed through a two-wire I2C interface that allows flexibility in routing and mixing audio channels.
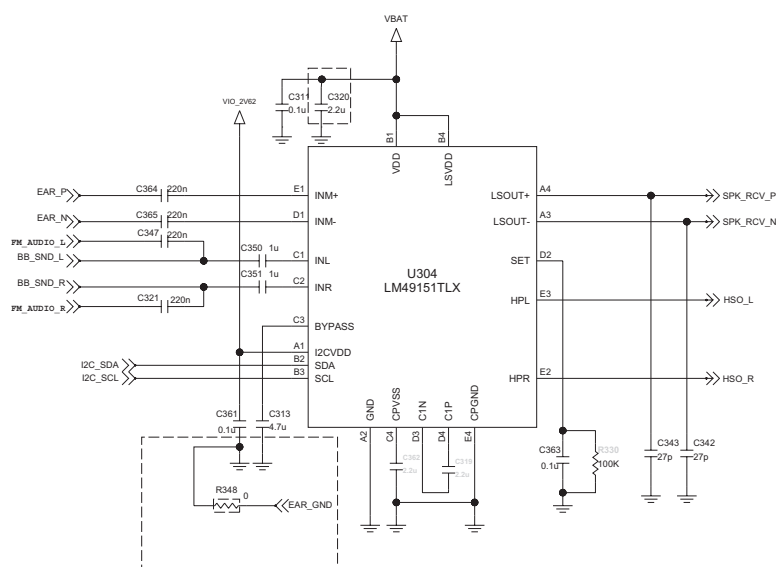
Figure 15 Audio amplifier PMIC

3.12.2. Microphone circuit

Figure 16 Microphone circuit

3.13. charging circuit

The bq25040 is a highly integrated Li-ion linear battery charger targeted at space-limited portable applications. It operates

from either a USB port or AC adapter and charges a single cell Li-Ion battery with up to 1.2A of charge current. The high input

voltage range with input over-voltage protection supports low-cost unregulated adapters.

MAIN FEATURES

• 30V input rating, with Over-Voltage Protection
(OVP)
• Input Voltage Dynamic Power Management
Feature
• 50mA integrated low dropout linear regulator
(LDO)
• 1% Battery Regulation Accuracy
• 10% Charge Current Accuracy
• Pin selectable USB 100mA and 500mA
maximum input current limit
• 4.2V @ 2.3A Test Jig mode
• Thermal Regulation Protection for Output Current
Control
• Low Battery Leakage Current, BAT Short-Circuit
Protection

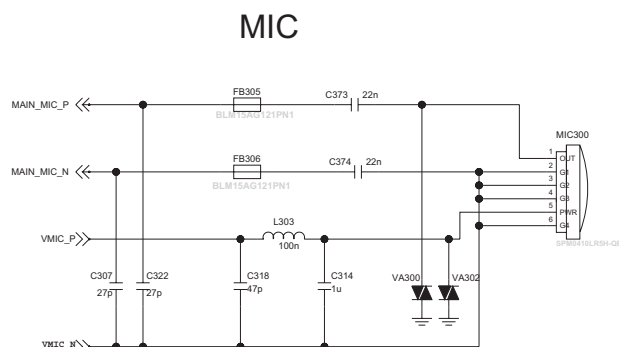Single Charging IC for uUSB

Figure 17 Charging circuit

3.14 FM radio & BLUETOOTH

● **FM radio**

Simultaneous operation with Bluetooth

• Support of US/Europe (87.5 to 108 MHz) and Japanese (76 to 90 MHz) FM band

• Wide dynamic range AGC

• Soft mute and stereo blend

• Adjustment-free stereo decoder and AFC

• Autonomous search tuning function (up/down) with programmability (threshold setting)

• RDS demodulator

• Audio output available over Bluetooth audio interface or dedicated audio output

• Control of FM via Bluetooth HCI or I2C

• Adaptive filter to suppress narrow band interference in the FM channel

● **Bluetooth**

General Features

- Small outline by LTCC substrate built-in RF function and Resin mold

- Integrated top BPF for Bluetooth and FM radio

- Integrated RDS/RBDS demodulator and decoder

- *Bluetooth*® 2.1+EDR conformity

- Secure Simple Pairing (SSP)

- Encryption Pause Resume (EPR)

- Enhance Inquiry Response (EIR)

- Link Supervision Time Out (LSTO)

- Sniff Sub Rating (SSR)

- Erroneous Data (ED)

- Packet Boundary Flag (PBF)

- WLAN coexistence including 802.15.2 three-wire coexistence support

- UART Interface

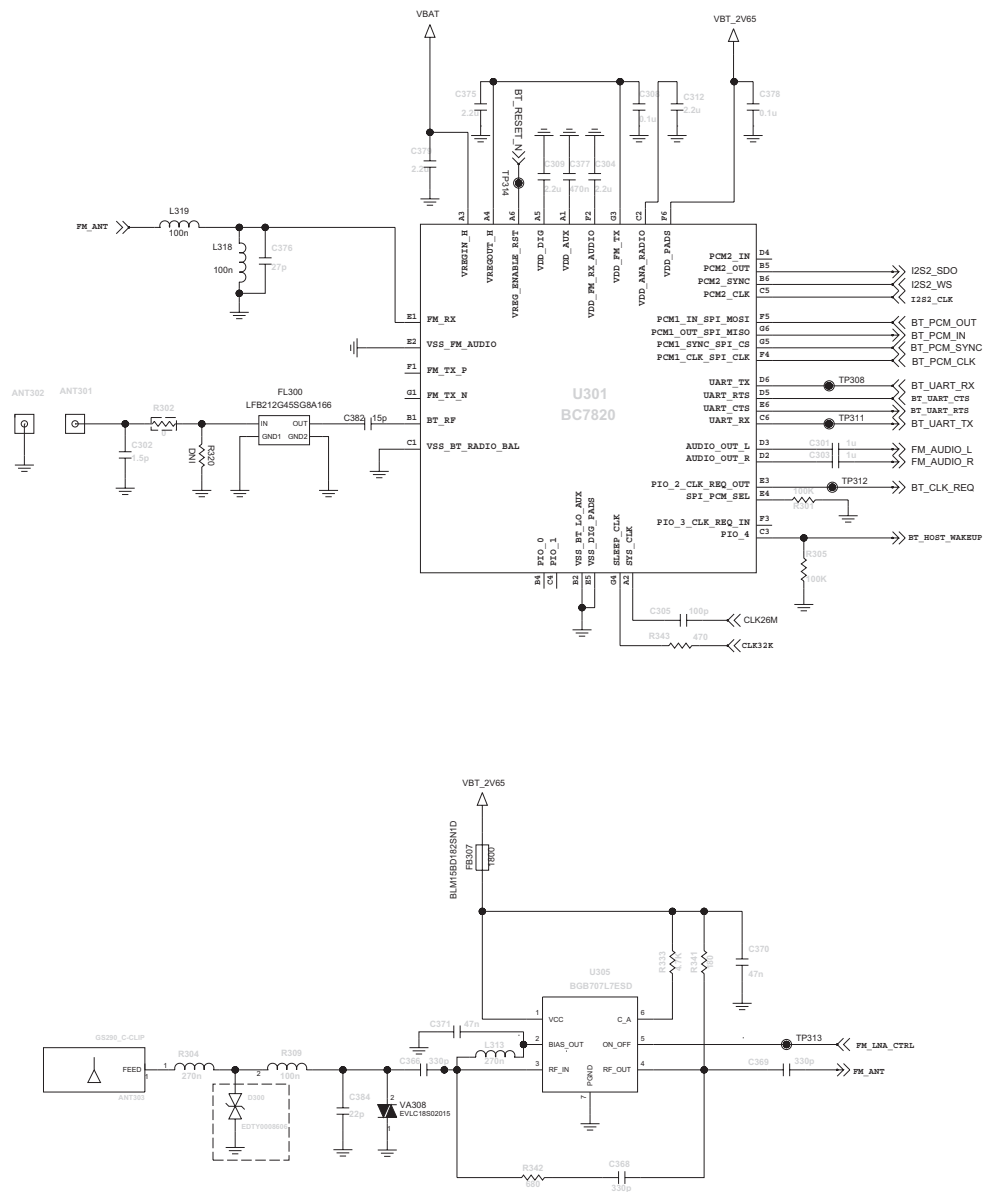- PCM Interface

- I2S Interface

- I2C Interface

Figure 18. Bluetooth / FM Radio Circuit Diagram

Bluetooth Radio

• Common TX/RX teminal simplifies external matching, eliminates external antenna switch
• No external trimming is required In production
• Bluetooth v2.1 + EDR Specification compliant

Bluetooth Transmitter

• +6 dBm RF Transmit power with level control from on-chip 6-bit DAC over a dynamic range > 30dB
• Class 1 and Class 2 support without the need for an external power amplifier or TX/RX switch.

Bluetooth Receiver

• Integrated channel filters
• Digital demodulator for improved sensitivity and co-channel rejection
• Real time digitized RSSI available on HCI interface
• Fast AGC for enhanced dynamic range
• Channel classification for AFH

Synthesiser

• Fully integrated synthesizer requires no external VCO varactor diode, resonator or loop filter
• Compatible with crystals between 7.5 and 40MHz(in multiples of 250KHz) or an external clock

Audio

• Single-ended stereo analogue output
• 16-bit 48 kHz digital audio bit stream output

Baseband and Software

• Internal 48Kbyte RAM, allows full speed data transfer, mixed voice and data, and full piconet operation, including all medium rate packet types
• Logic for forward error correction, header error control, access code correlation. CRC, demodulation, encryption bit stream generation, whitening and transmit pulse shaping. Supports all Bluetooth v 2.0 + EDR features incl. ESCO and AFH
• Transcoders for A-law, u-law and linear voice from host and A-law, u-law and CVSD voice over air

Physical Interfaces

• Synchronous serial interface up to 4Mbits/s for system debugging
• UART interface with programmable baud rate up to 4Mbits/s with an optional bypass mode
• USB v1.1 interface
• I2C slave for FM
• Two audio PCM interfaces (input and output)
• Analogue stereo (output only)
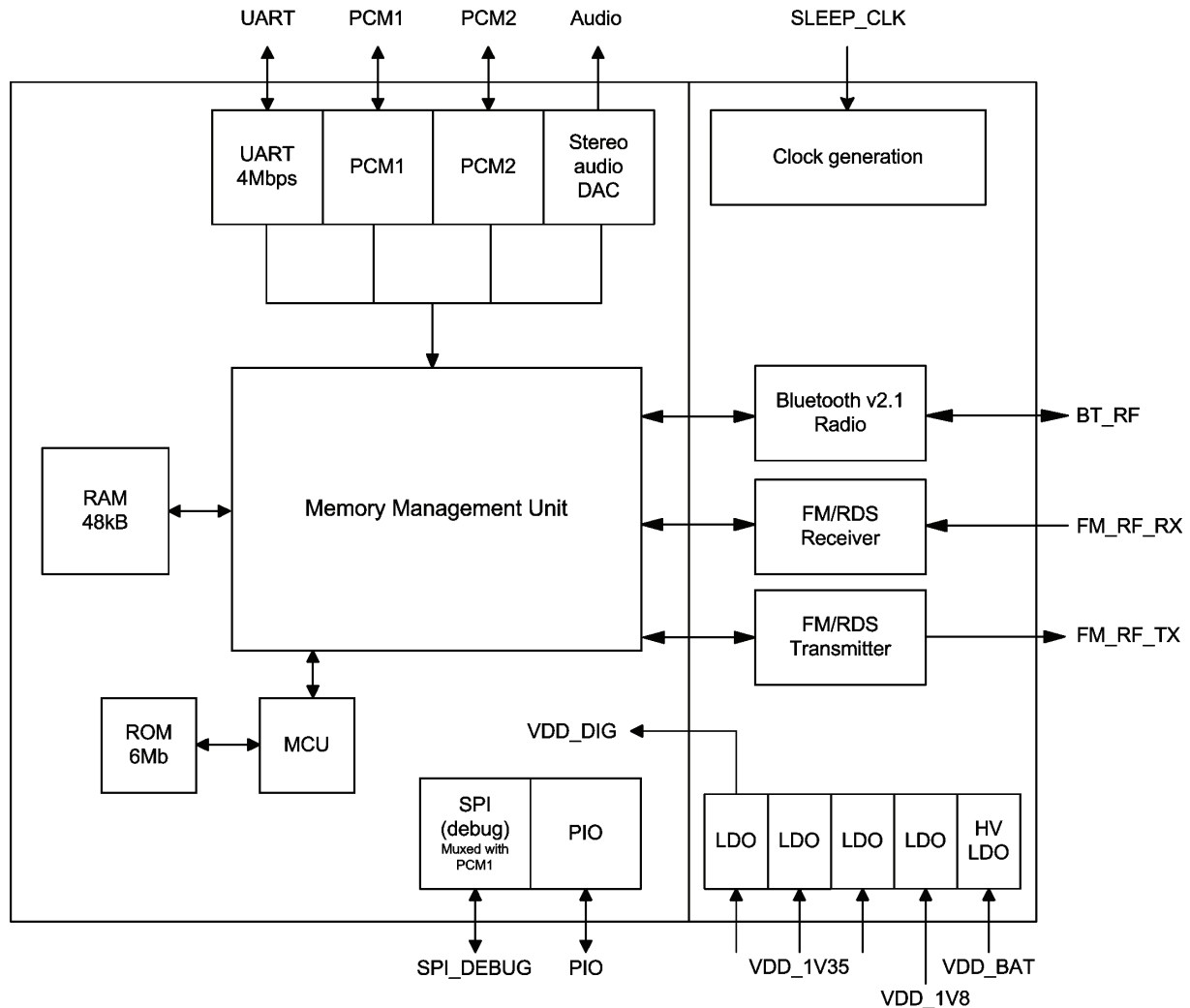
3. TECHNICAL BRIEF

Figure 19. Bluetooth / FM Radio Functional Block Diagram

3.15. 5pin u-USB Interface connector

- *Micro USB Integrated IC*
- Multiplexing USB, UART and audio on a single micro USB connector
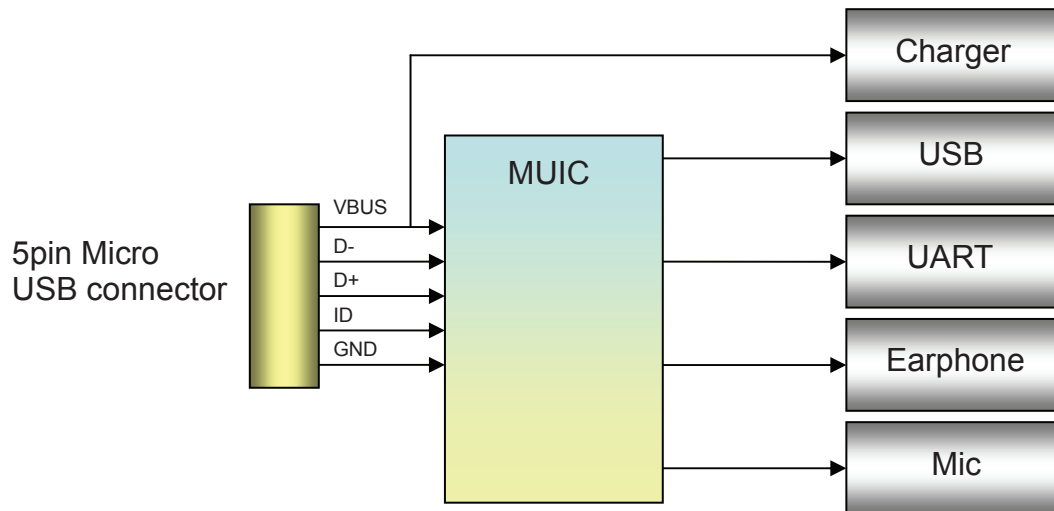
Figure 20. u-USB Connector Block Diagram

Micro USB

Figure 21.U-USB Connector circuit

The MAX14526 is a complete solution for multiplexing   USB, UART and audio on a single mini/micro USB connector. It contains an internal method for determining the device connected and uses an I2C bus for control.

The switch will multiplex multiple inputs (USB, UART,Microphone, Stereo and Audio) on one mini/microUSB connector. The USB and UART inputs support Hi-Speed USB and the audio inputs feature negative rail signal operation allowing simple dc coupled headset speakers. The VB connection is protected against faults up to 28 volts. There is an internal device detection method which uses the USB ID signal pin and the voltage on VBUS.

Each accessory will have a unique detection based on resistor values and voltage on VBUS. The host microprocessor uses I2C to control the switch position as well as read the results of the accessory detection.

The MAX14526 will also detect USB chargers including dedicated chargers (D+/D- shorted) and high power host/hub chargers.

*RF Block Diagram

Figure 22 GS290 RF part Block Diagram

3.16. General Description

The RF transceiver (PMB 6272 SMARTi-PM) is an integrated single chip, quad-band transceiver for GSM850/GSM900/GSM1800/GSM1900 designed for voice and data transfer applications. The transceiver provides an analog I/Q baseband interface and consists of a direct conversion receiver and a quad-band polar transmitter for GSM and EDGE with integrated PGA functionality. Further on a completely integrated SD-synthesizer with HSCSD and GPRS/EDGE capability, a digitally controlled reference oscillator with three outputs, a fully integrated quad-band RF oscillator and a three wire bus interface with all necessary control circuits complete the transceiver.
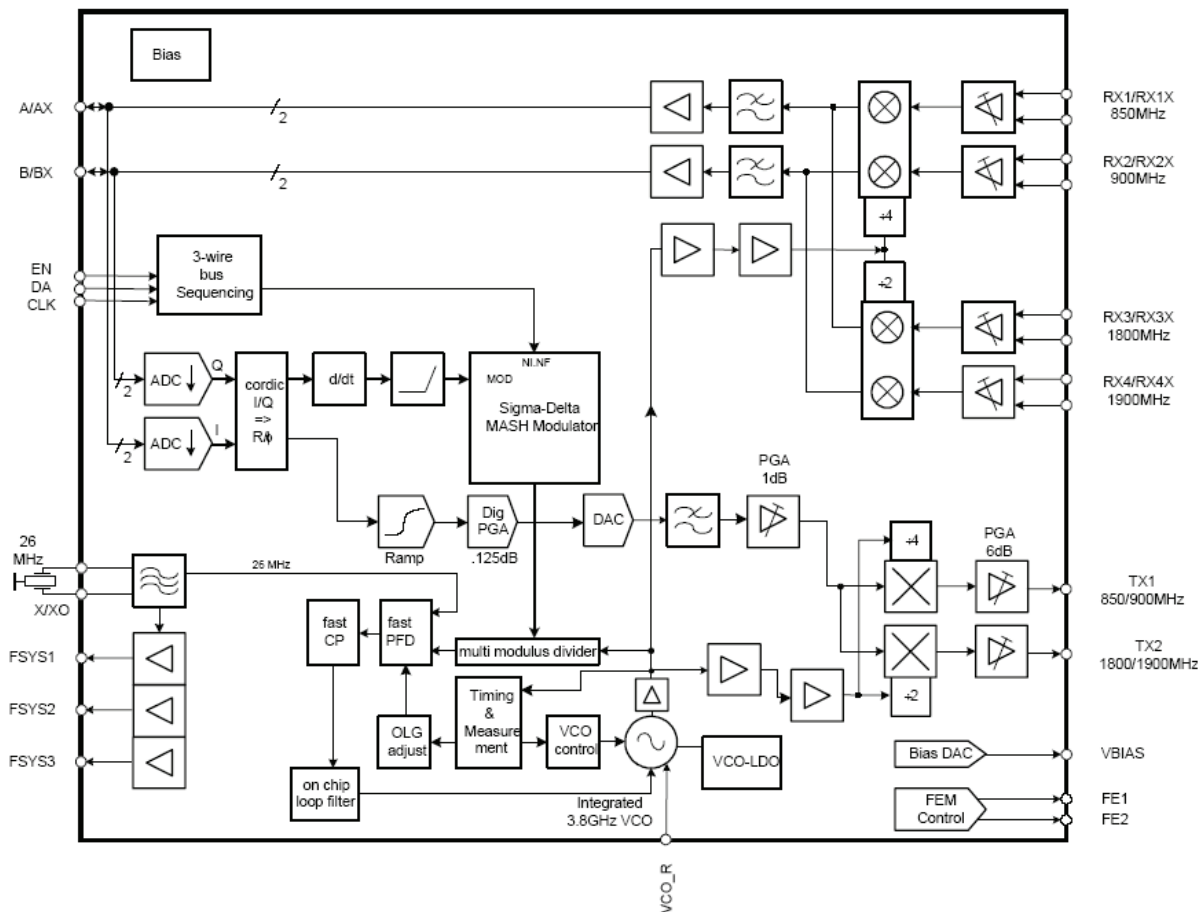
Figure 23 RF transceiver PMB6272 SMARTi-PM functional block diagram
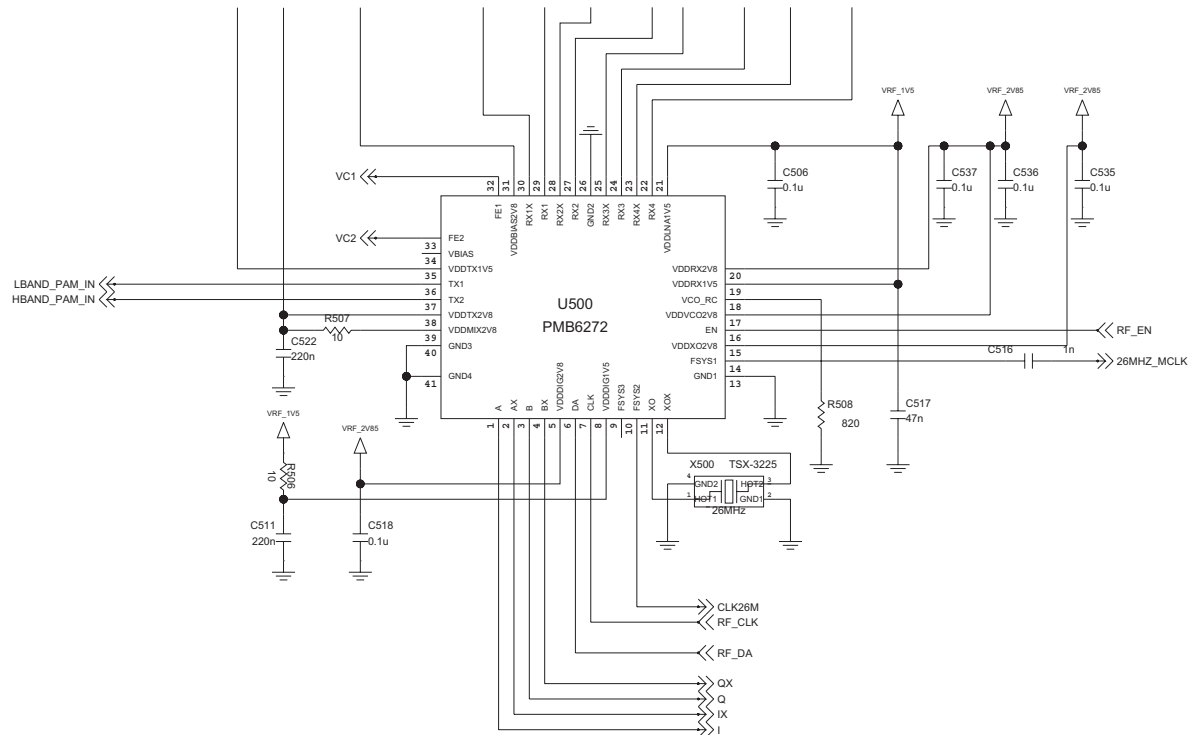
Figure 24 RF transceiver PMB6272 SMARTi-PM schematic

3. TECHNICAL BRIEF

3.17. Receiver part
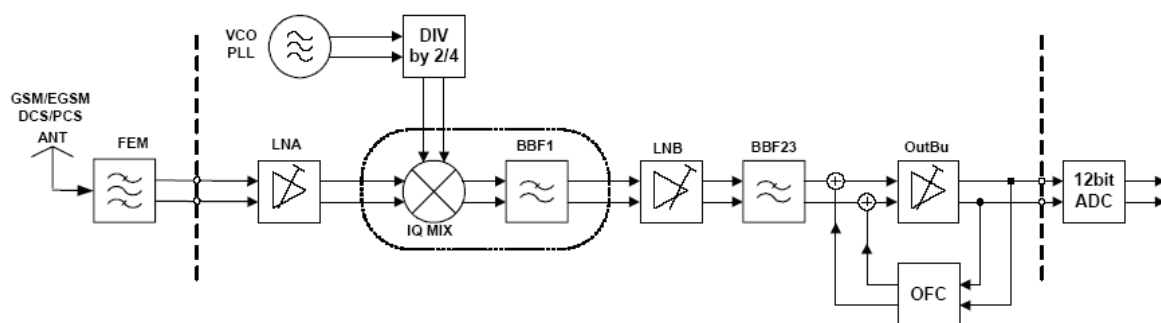
Figure 25 Receiver part block diagram

The constant gain direct conversion receiver contains all active circuits for a complete receiver chain for GSM/GPRS/EDGE (see Figure 25). The GSM850/900/DCS1800/ PCS1900 LNAs with balanced inputs are fully integrated. No inter-stage filtering is needed. The orthogonal LO signals are generated by a divider-by-four for GSM850/900 band and a divider-by-two for the DCS1800/PCS1900 band. Down conversion to baseband domain is performed by low/high band quadrature direct down conversion mixers. The baseband chain contains a LNB (low noise buffer), channel filter, output buffer and DC-offset compensation. The 3rd order low pass filter is fully integrated and provides sufficient suppression of blocking signals as well as adjacent channel interferers and avoids anti-aliasing through the baseband ADC. The receive path is fully differential to suppress on-chip interferences. Several gain steps are implemented to cope with the dynamic range of the input signals. Depending on the baseband ADC dynamic range, single- or multiple gain step switching schemes are applicable. Furthermore an automatic DC-offset compensation can be used (depending on the gain setting) to reduce the DC-offset at baseband-output. A programmable gain correction can be applied to correct for front end- and receiver gain tolerances.

3.18. Transmitter part

The GMSK transmitter supports power class 4 for GSM850 and GSM900 as well as power class 1 for DCS1800 and PCS1900. The digital transmitter architecture is based on a very low power fractional-N Sigma-Delta synthesizer without any external components (see Figure39). The analog I/Q modulation data from the baseband is converted to digital, filtered and transformed to polar coordinates. The phase/frequency signal is further on processed by the Sigma-Delta modulation loop. The output of its associated VCO is divided by four or two, respectively, and connected via an output buffer to the appropriate single ended output pin. This configuration ensures minimum noise level. The 8PSK transmitter supports power class E2 for GSM850 and GSM900 as well as for DCS1800 and PCS1900. The digital transmitter architecture is based on a polar modulation architecture, where the analog modulation data (rectangular I/Q coordinates) is converted to digital data stream and is subsequently transformed to polar coordinates by means of a CORDIC algorithm. The resulting amplitude information is fed into a digital multiplier for power ramping and level control. The ready processed amplitude signal is applied to a DAC followed by a low pass filter which reconstructs the analog amplitude information. The phase signal from the CORDIC is applied to the Sigma-Delta fractional-N modulation loop. The divided output of its associated VCO is fed to a highly linear amplitude modulator, recombining amplitude and phase information. The output of the amplitude modulator is connected to a single ended output RF PGA for digitally setting the wanted transmit power. The PA interface of SMARTi-PM supports direct control of standard dual mode power amplifiers (PA's) which usually have a power control input VAPC and an optional bias
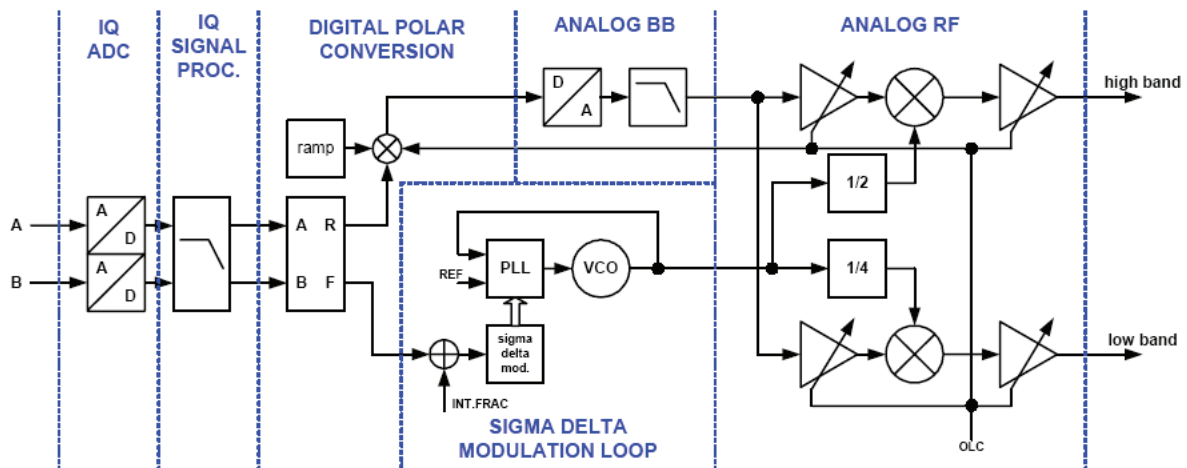
Figure 26 Transmitter part block diagram

control pin VBIAS for efficiency enhancement. In GMSK mode, the PA is in saturated high efficiency mode and is controlled via its VAPC pin directly by the baseband ramping DAC. In this way both up- / down-ramping and output power level are set. In 8PSK mode, the ramping functionality is assured by an on-chip ramping generator, whereas output power is controlled by the PGA's as described above.

3.19. RF synthesizer

The transceiver contains a fractional-N sigma-delta synthesizer for the frequency synthesis in the RX operation mode. For TX operation mode the fractional-N sigma-delta synthesizer is used as Sigma-Delta modulation loop to process the phase/frequency signal. The 26MHz reference signal is provided by the internal crystal oscillator. This frequency serves as comparison frequency of the phase detector and as clock frequency for all digital circuitry.The divider in the feedback path of the synthesizer is carried out as a multi-modulus divider (MMD). The loop filter is fully integrated and the loop bandwidth is about 100 kHz to allow the transfer of the phase modulation. The loop bandwidth is automatically adjusted prior to each slot (OLGA[2]). To overcome the statistical spread of the loop filter element values an automatic loop filter adjustment (ALFA) is performed before each synthesizer startup. The fully integrated quad-band VCO is designed for the four GSM bands (850, 900, 1800, 1900 MHz) and operates at double or four times transmit or receive frequency. To cover the wide frequency range the VCO is automatically aligned by a binary automatic band selection (BABS) before each synthesizer startup.

3.20. Front End Module control

Implemented in the S-Gold3 (FL500) are two outputs which are VC1, VC2 for direct control of front end modules with two logic input pins to select RX and TX mode as well as low and high band operation..

Table 8 FEM Control Logic

		VC1 (FE1)	VC2 (FE2)
GSM850 / 900_TX		H	L
GSM 1800 / 1900_ TX		L	H
GSM850 / 900_RX		L	L
GSM 1800 / 1900_ RX		L	L

CI:$0.05(CMOS->PIN)
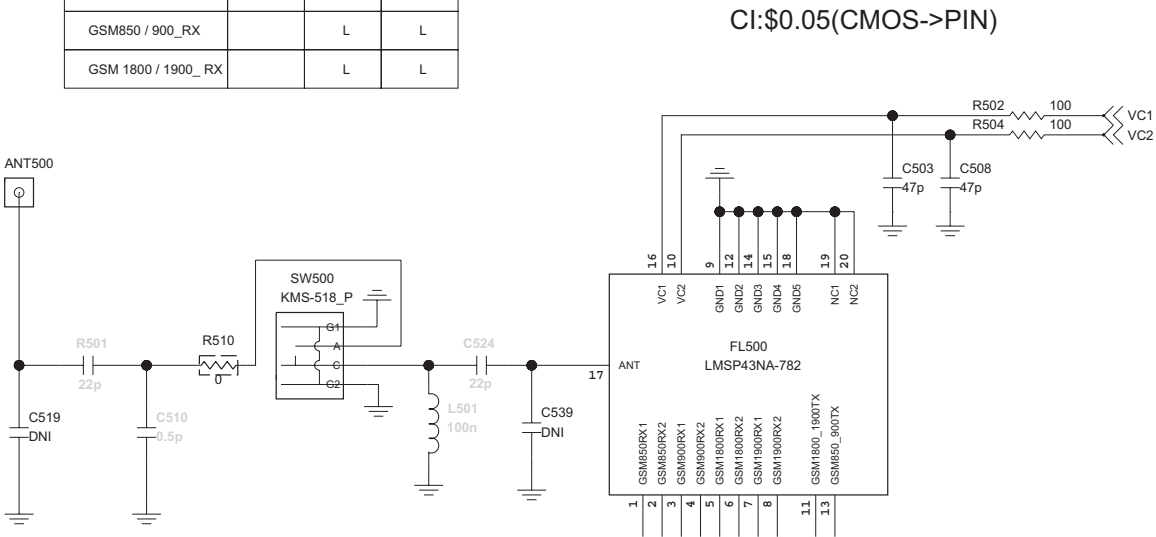
Figure 27 FEM schematic

3. TECHNICAL BRIEF

3.21. Power Amplifier Module

The SKY77344 Power Amplifier Module(PAM) is designed in a compact from fact for quad-band cellular handsets comprising GSM850/900,DCS1800,PCS1900,supporting GMSK and linear EDGE modulation. Class12 General Packet Radio Service(GPRS) multi-slot operation is also supported.

The module consists of a GSM850/900 PA block and a DCS1800/PCS1900 PA block,impedance matching circuitry for 50ohm input and output impedances, and a Multi-function Power Amplifier Control(MFC) block. A custom CMOS integrated circuit provides the internal MFC function and interface circuitry.

Two separate Heterojunction Bipolar Transistor(HBT) PA blocks are fabricated onto InGaP die; one supports the GSM850/900 bands, the other supports the DCS1800 and PCS1900 bands. Both PA blocks share common power supply pins to distribute current. The InGaP die, the silicon die, nad the passive components are mounted on a multi layer laminate substrate. The assembly is encapsulated with plastic overmold.

RF input and output ports are internally matched to 50ohm to reduce the number of external components Extremely low leakage current(2.5uA) maximizes handset standby time. Band select(BS) circuitry select GSM transmit frequency band(logic0) and DCS/PCS transmit frequency(logic1). MODE circuitry selects GMSK modulation (logic0) or EDGE modulation(logic1). VRAMP controls the output power for GMSK modulation and provides bias optimization for EDGE modulation depending on the state of MODE control.

The integrated multi-function(MFC) provides envelope amplitude control in GMSK mode, reducing sensitivity to input drive, temp, power supply, and process variation. In EDGE mode, the MFC configures the PA for fixed gain, and provides the ability to optimize the PA bias operation at different power levels, This circuitry regulates PA bias conditions, reducing sensitivity to temp., power supply, and process variation. The Enable input signal(pin8) provides a standby state to minimize battery drain..

.Table 9 PAM pin description

Pad	Name	Description
1	MODE	GMSK/EDGE Power Control Mode: Low = GMSK, High = EDGE
2	DCS/PCS_IN	RF Input (DCS / PCS Bands) DC Blocked
3	BS	Band Select
4	VBIAS	Analog PA Bias Control (ALL BANDS, EDGE MODE)
5	VBATT	DC Supply
6	VRAMP	Analog Output Power Control (ALL BANDS, GMSK MODE)
7	GSM_IN	RF Input (CEL / EGSM Bands) DC Blocked
8	EN	Transmit Enable / Disable. Low = Disable
9	GSM_OUT	RF Output (CEL / EGSM Bands) DC Blocked
*12	RSVD2	Reserved
*16	DCS/PCS_OUT	RF Output (DCS / PCS Bands) DC Blocked
*10, 11, 13—15	GND	Ground
Pad	GND PAD GRID	Ground pad grid is device underside.

3.22. PAM Schematic
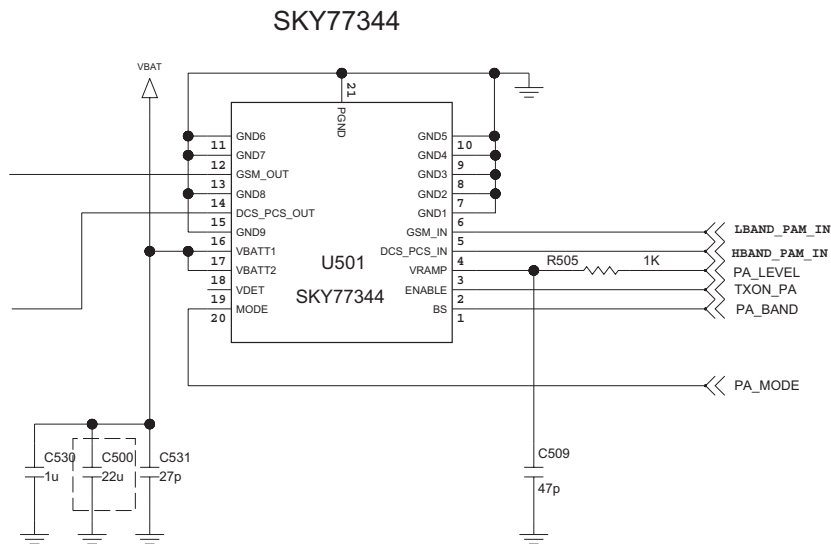
Figure 28 PAM schematic

4. TROUBLE SHOOTING

4.1 Trouble shooting test setup
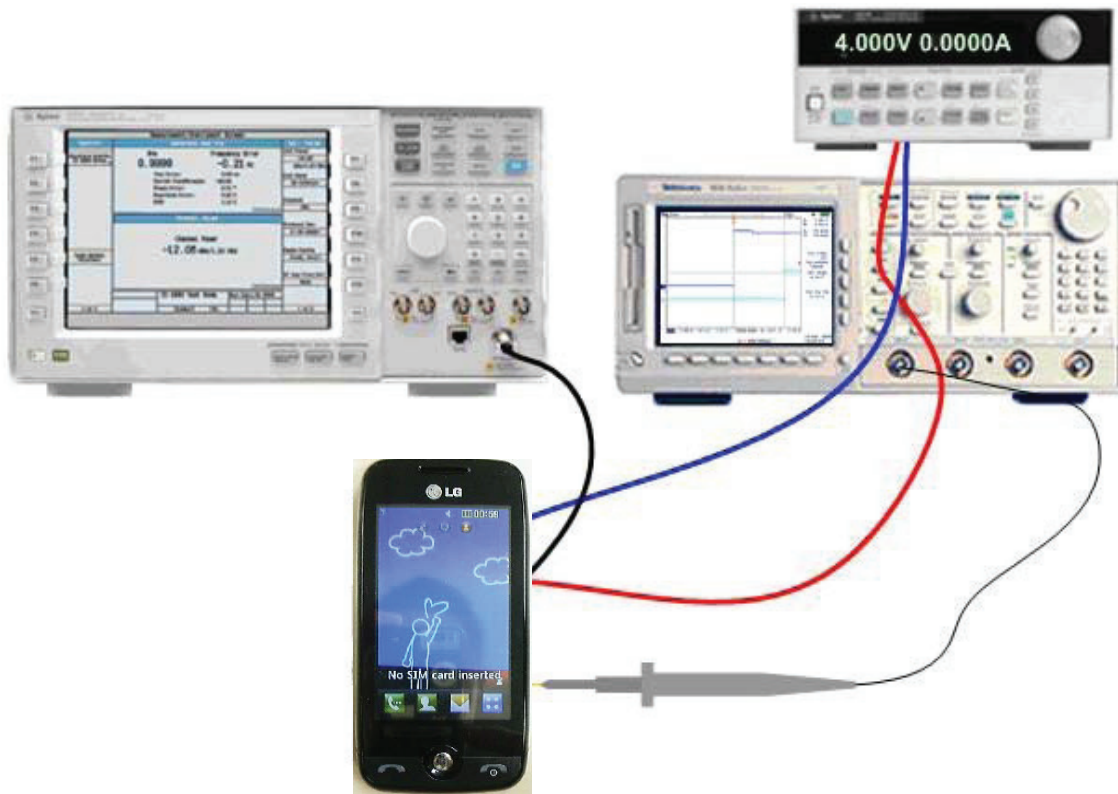
Equipment setup

Power on all of test equipment

- Connect PIF-UNION JIG or dummy battery to the DUT for power up.

- Connect mobile switch cable between Communication test set and DUT when you need to make a phone call.

- Follow trouble shooting procedure

4.2 Power on Trouble

Check Points

-Battery Voltage(Need to over 3.35V)

-Power-On Key detection (PWRON signal)

-Outputs of LDOs from PMIC

Power On

External Reset JIG Connector

PMIC
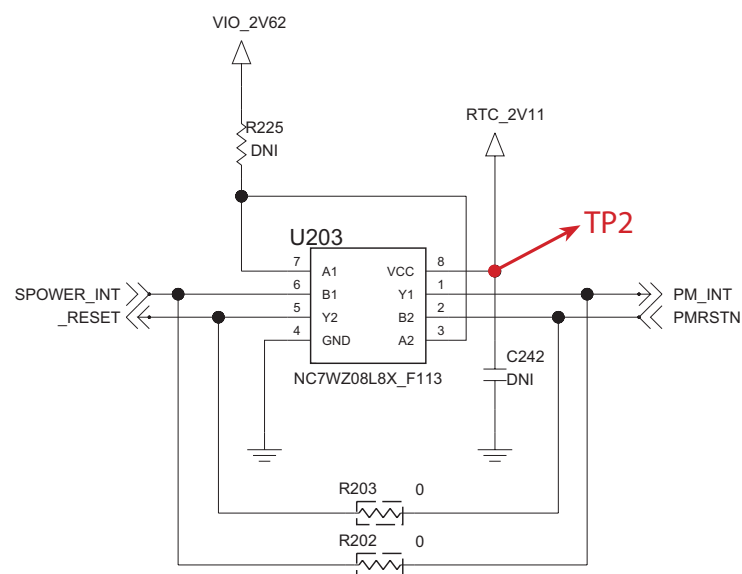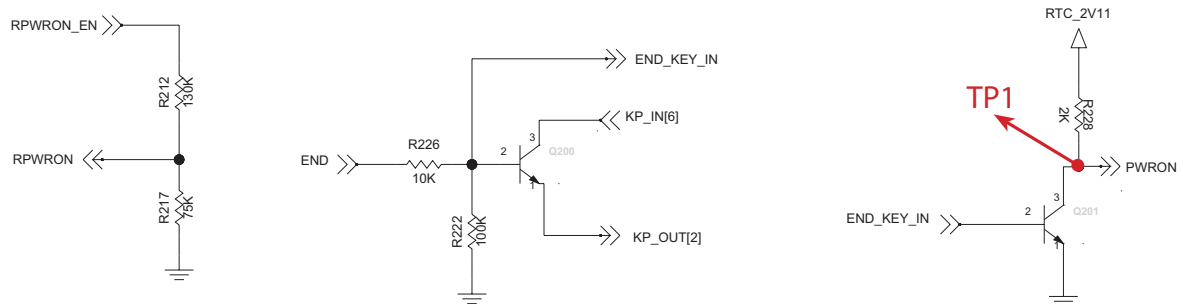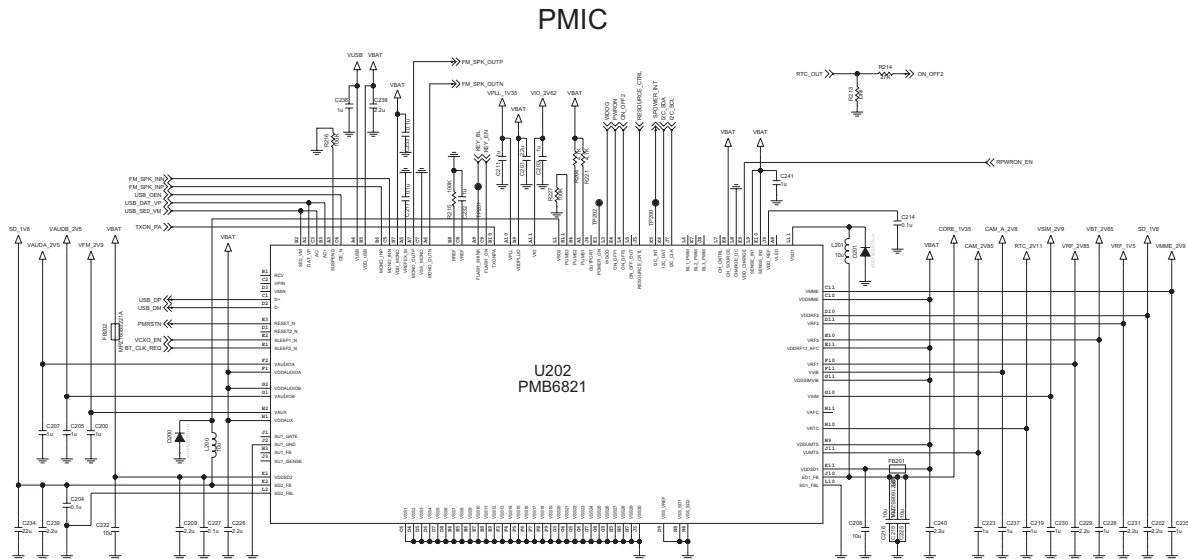
LDO	Net name	Output Voltage	Output Current	Usage
SD1	CORE_1V35	1.35V	600mA	Core & for LDO
SD2	SD_1V8	1.8V	300mA	Memory
VAUX	VFM_2V9	2.9V	100mA	Touch, LCD
VIO	VIO_2V62	2.62V	100mA	Peripherals
VSIM	VSIM_2V9	2.9V	70mA	SIM card
VMME	VMME_2V9	2.9V	150mA	u-SD
VUMTS	CAM_2V85	2.85V	110mA	Camera
VUSB	VUSB	3.1V	40mA	USB
VLED	VLED	2.9V	10mA	Not used
VAUDIOa	VAUDA_2V5	2.5V	200mA	Stereo headset, Mono earpiece
VAUDIOb	VAUDB_2V5	2.5V	50mA	Analog parts of S-Gold
VRF1	VRF_2V85	2.85V	150mA	2.85 V supply for SMARTi-PM RF transceiver
VRF2	VRF_1V5	1,53V	100mA	1.5 V supply for SMARTi-PM RF transceiver
VRF3	VBT_2V65	2.7V	150mA	BT/FM Radio
VPLL	VPLL_1V35	1.35V	30mA	S-GOLD3 PLL
VRTC	VRTC_2V11	2.11V	4mA	Real Time Clock
VAFC	VAFC	2.65V	5mA	Not used
VVIB	CAM_A_2V8	2.8V	140mA	Camera

```
                    START

        Battery Voltage,          No      Change Battery or
        higher than 3.35V ?       ───►    Check Battery
                                          connector
                │ Yes

        "PWRON" signal            No      Check the RPWRON,
        Check 3 pin of Q201       ───►    replace Q201
                │ Yes

        "_RESET" signal           No      Check solder
        Check 8 pin of U203       ───►    U203 or replace it
                │ Yes

        Check the all LDO's       No      Check solder
        output                    ───►    U202 or replace it
        Is it correct?
                │ Yes

        Is the 26MHz              No      Check solder X500
        clock From X500           ───►    or replace it
        signal correct?
                                          Check 1 pin of X500
                │ Yes                     Or Check 11 pin of
                                          U500
        Replace main PCB
```

TP1
Q201

TP2
U203

U202

X500   11pin of U500
U500
1pin of X500

Change Battery Connector

1. Don't use Heat Gun

2. Replace main PCB
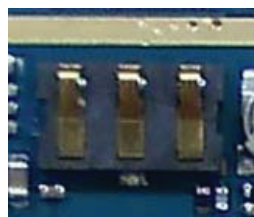
4.3 Charging trouble

Check Points

-Connection of TA (check TA voltage 4.8V)

-Charging Current Path component voltage drop

-Battery voltage

1 Charging method : CC-CV

2 Charger detect voltage : 4.0 V

3 Charging time : 2h 00m

4 Charging current : 645 mA

5 CV voltage : 4.2 V

6 Cutoff current : 105 mA

7 Full charge indication current (icon stop current) : 105 mA

8 Recharge voltage : 4.16 V

4.2V~3.74V	3.73V~3.65V	3.65V~3.59V	3.59V~3.35V

Single Charging IC for uUSB

START

5pin IO(CN200)
Is soldered ? — No → Resolder the CN200

5pin IO(CN200)

Yes

Source pin
of U201 = 4.8V ? — No → The TA can be
broken
Change other TA
then retest

U401
TP1: Source pin

Yes

Output pin
of U201 =4.2V? — No → Check solder
U201 or replace it

U401
TP2: Output pin

Yes

Battery voltage is
over 3.4V? — No → Waiting until
battery
Voltage goes up to
3.4V

Yes

Battery thermistor
value
is about 10K? — No → Change the Battery
retest

Yes

Charge is operating properly
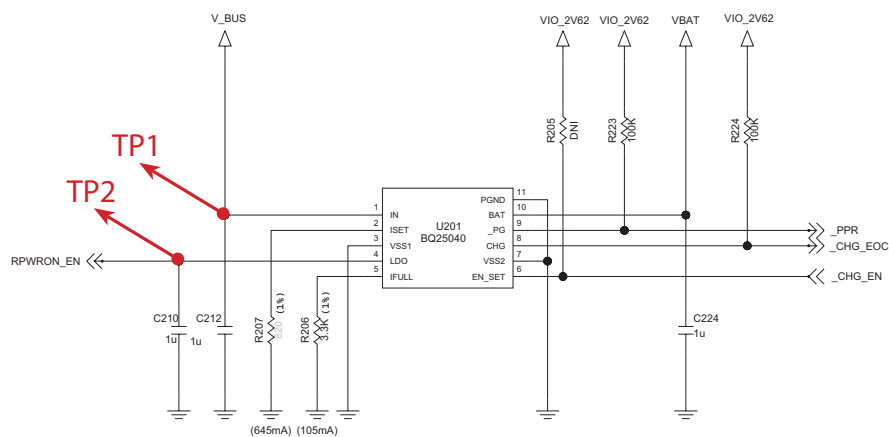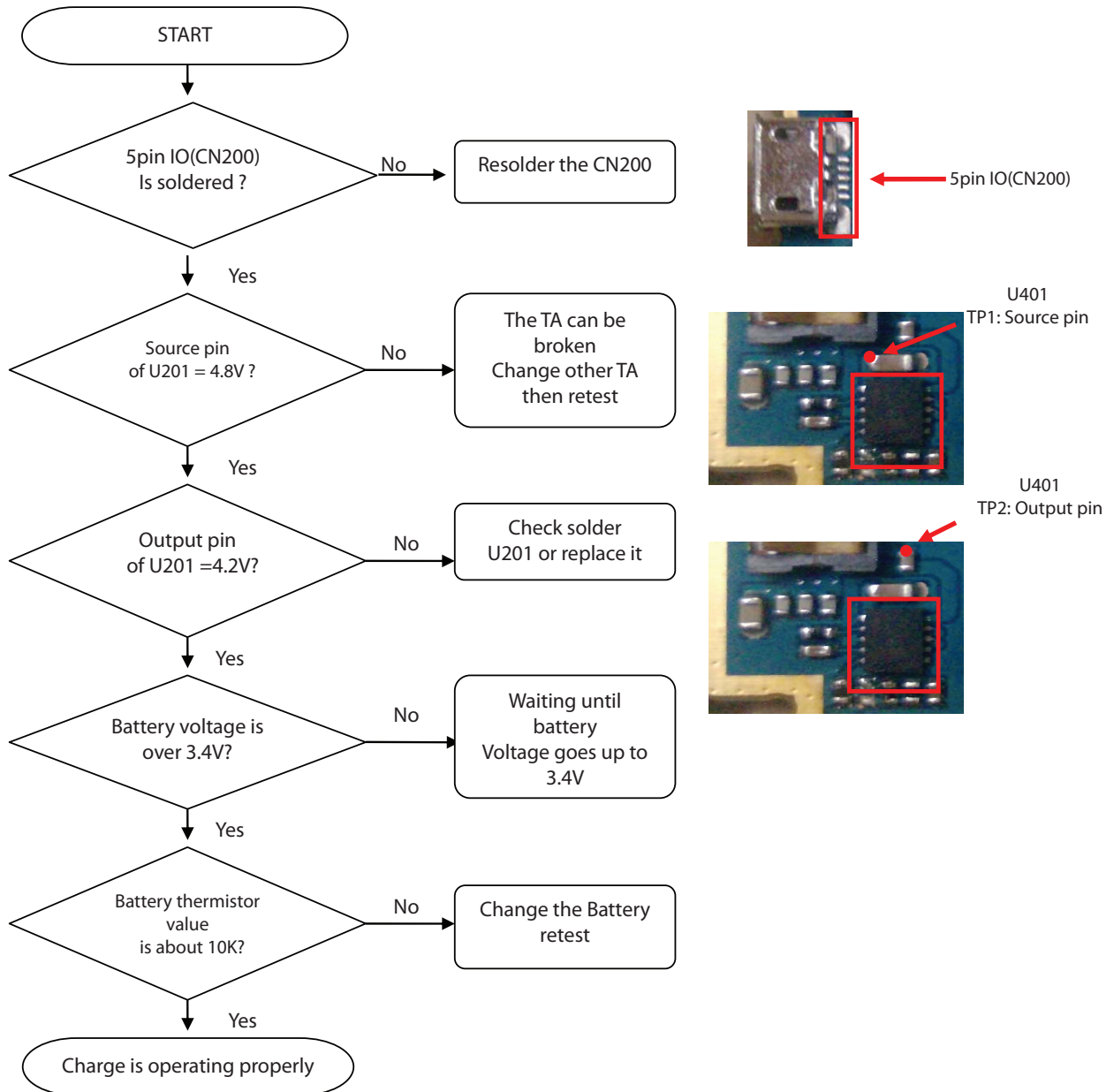
4.4 LCD display trouble

Check Points

-LCD assembly status (LCD FPCB, Connector on FPCB)

-EMI filter soldering

-Connector combination

LCD Connector

Pin2 : LCD_VSYNC_I
Pin3 : MAKER_ID
Pin11 : IF_MODE(IF1)
Pin18 : OPEN(OTP)
Pin19 : IF_MODE(IF0)

LCD Interface Mode		
Maker	IF	Maker ID
SHARP	H	L
LGIT	L	H
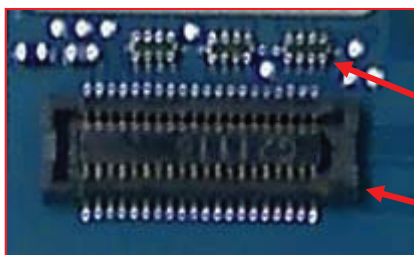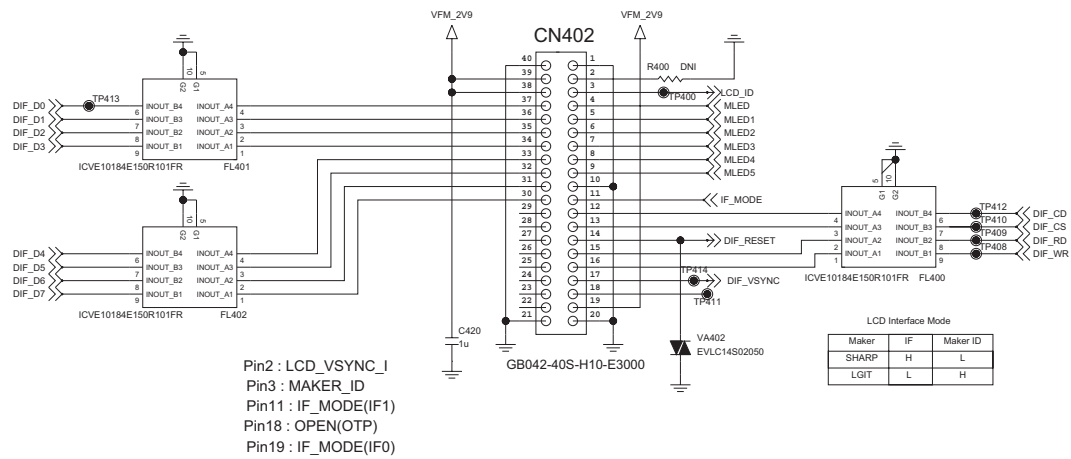
Check signal flow via EMI filter

Check the connection LCD FPCB Connector

Charge Pump

START

Check LCD connector combination then LCD test with New LCD

Is LCD FPCB normal? — No → Replace LCD FPCB

Yes

Signal is normal on DIF Signal FL400, FL401, FL402 — No → Check solder and repair Damaged filter

Yes

Assemble

FL400

FL402   FL401
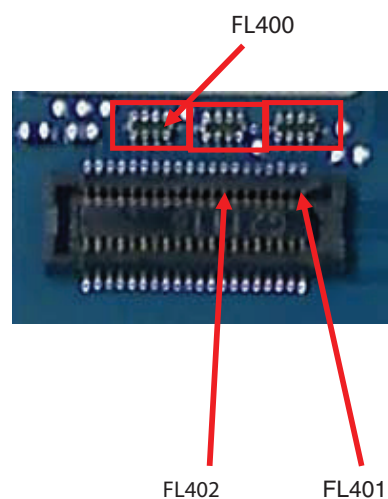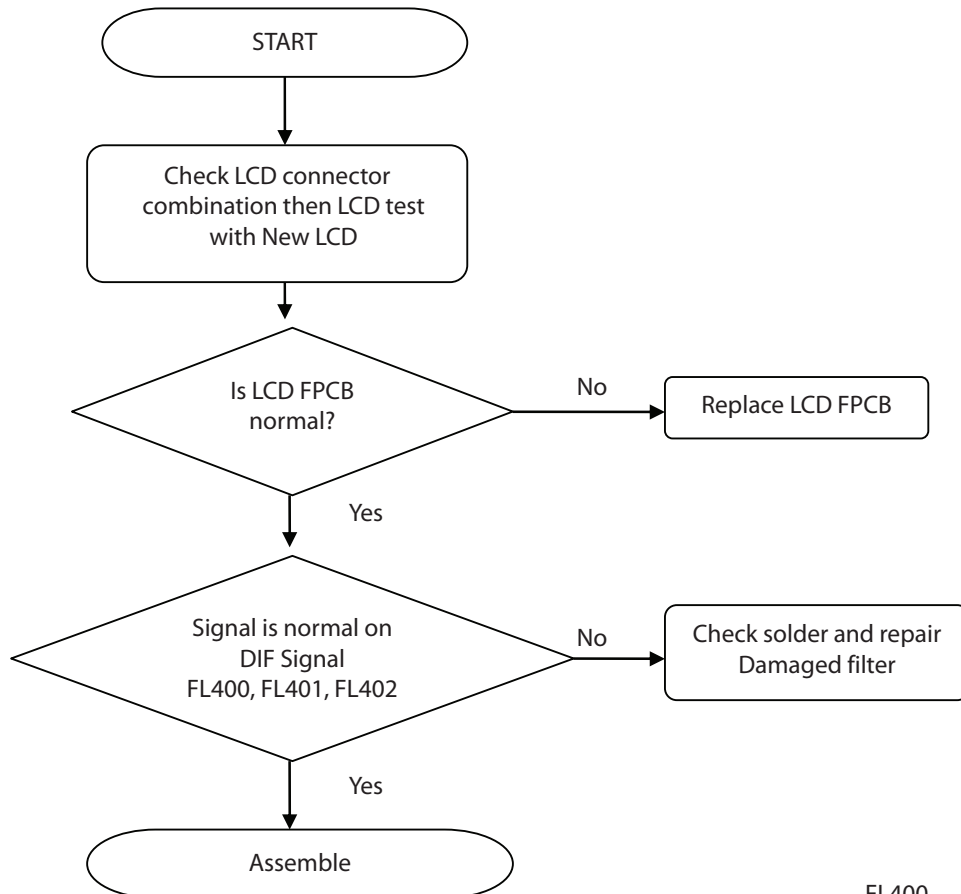
4.5 Camera Trouble

Check Points

-Connectors combination

-Socket status

2M FF CAM Connector
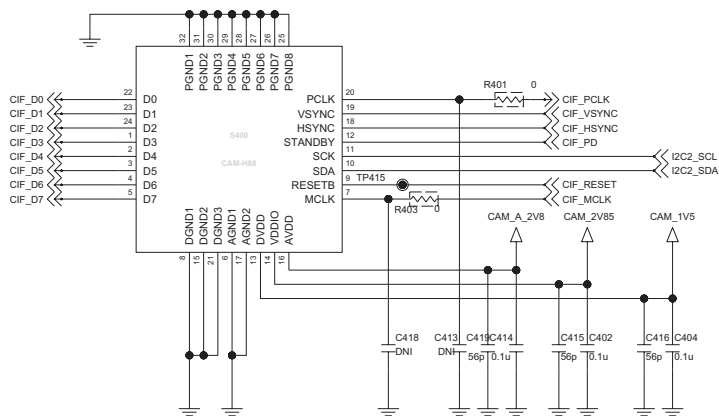
CAMERA PART POWER
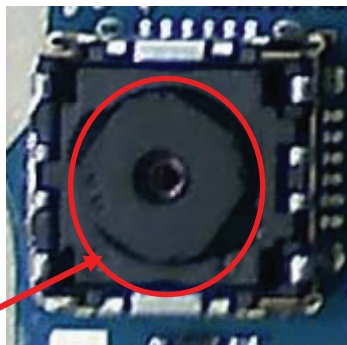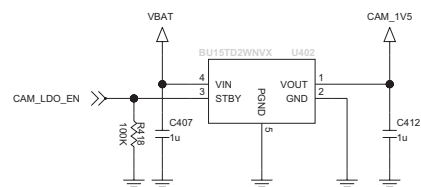
Check the connector combination

START

Check camera connector,
24pin main PCB connector
combination then Camera test
with equipped camera module

Yes

Replace New Camera
module
Working properly?

No → Replace
Main PCB

Yes

Replace Camera module

Yes

Assemble
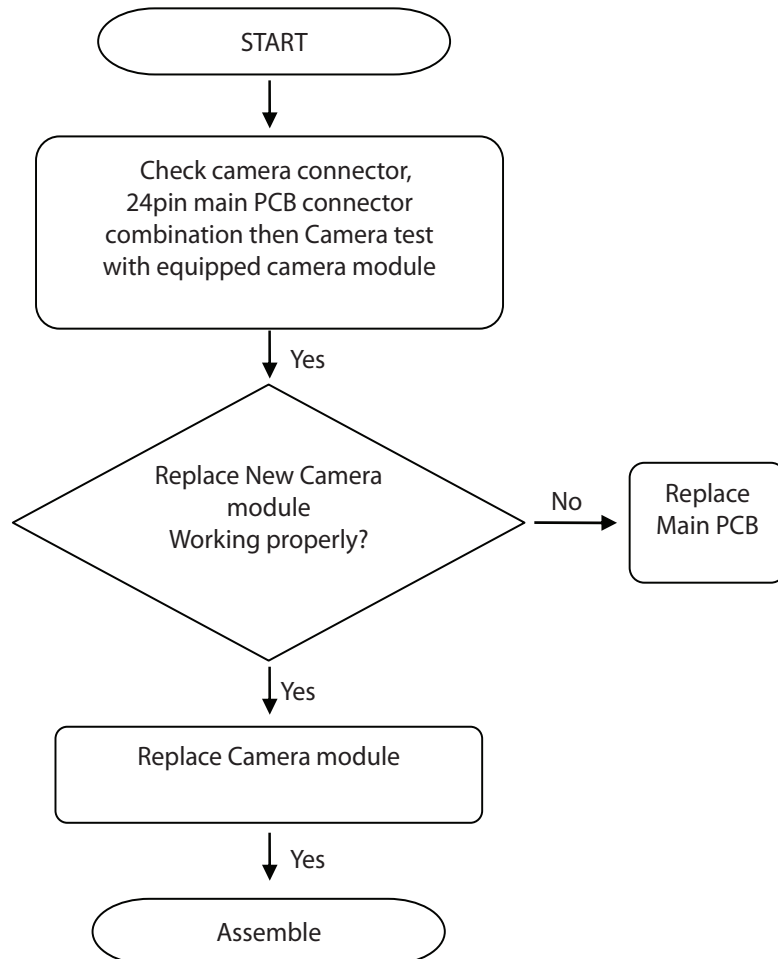
CAM connector

Change CAM connector

So, follow Next sequences

1. Remove fault CAM connector
   with heat gun.

2. Clear PAD

3. Change CAM connector
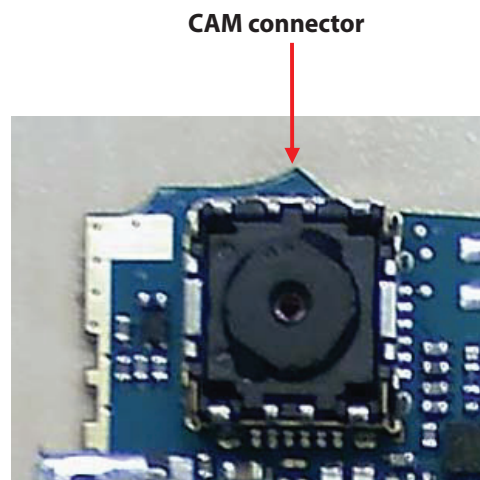
4.6 Receiver & Speaker trouble

Check Points

-Speaker contact

-Audio amp soldering

AUDIO AMP SUB SYSTEM & SIGNAL DISTRIBUTOR

Receiver & Speaker

TP2

Speaker contact

C342

TP1

C343

Audio Subsystem

C365
C364

```
┌─────────────────────┐          ┌─────────────────────┐
│  Check Speaker's    │   No     │  Connect Speaker    │
│  Combination with   │ ──────▶  │  completely.        │
│  PCB.               │          │                     │
└─────────────────────┘          └─────────────────────┘
           │ Yes
           ▼
      ◇─────────────◇            ┌─────────────────────┐
     ╱ Input Signal  ╲   No      │  Replace Main Board │
    ◇  Good(C364,C365 ◇ ──────▶  │                     │
     ╲  ) ?          ╱           └─────────────────────┘
      ◇─────────────◇
           │ Yes
           ▼
      ◇─────────────◇            ┌─────────────────────┐
     ╱ Output Signal ╲   No      │  Replace Audio      │
    ◇  High(C343,C342)◇ ──────▶  │  AMP(U304)          │
     ╲  ?            ╱           └─────────────────────┘
      ◇─────────────◇
           │ Yes
           ▼
   ┌─────────────────────┐
   │      Assemble       │
   └─────────────────────┘
```
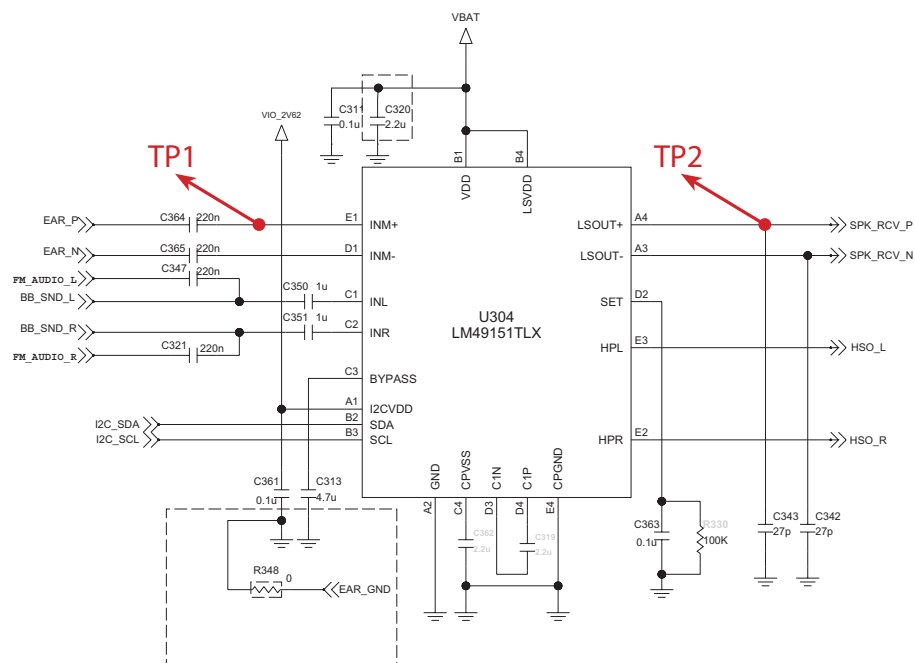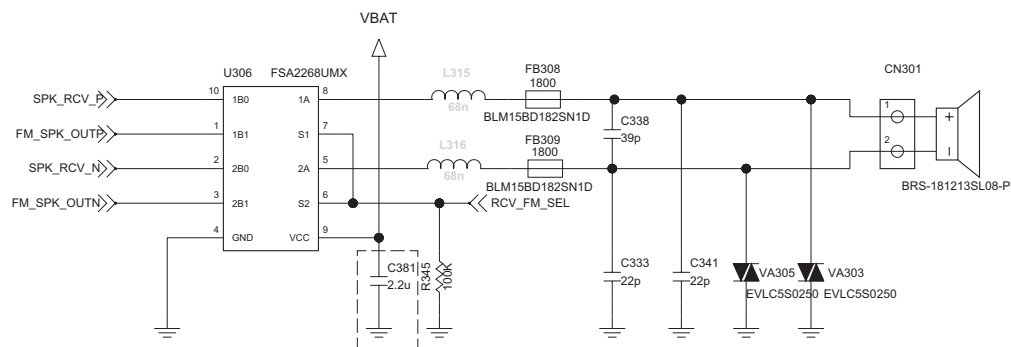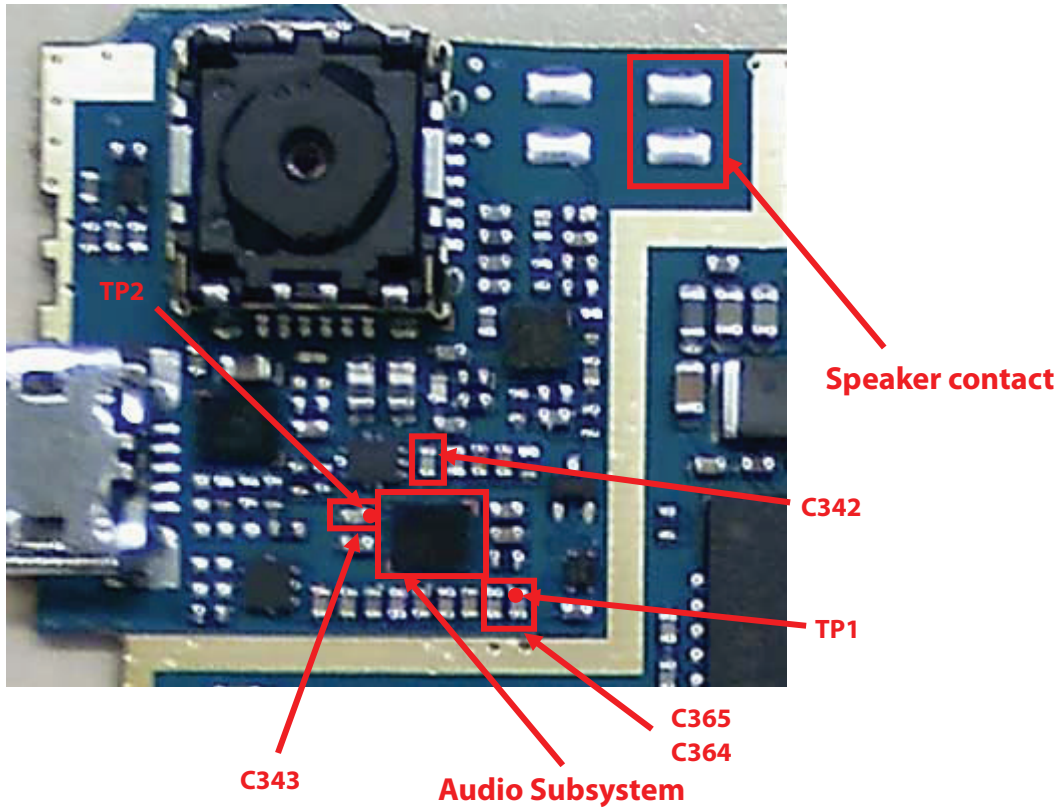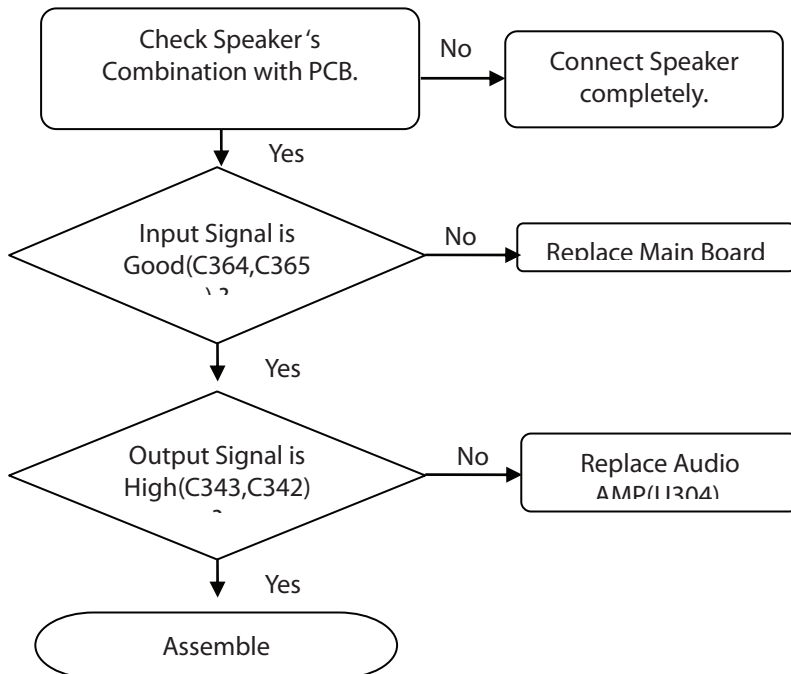
4.7 Microphone trouble

Check Points

-Microphone hole

-Mic. Bias & signal line

START

Check microphone sound hole

MIC Bias ON?(2.5V) When Call? (L303)

No → Check mic. Bias line

Yes

MIC Siganl OK? (FB305, FB306)

No → Replace MIC

Yes

MIC work properly?

No → Replace PCB

Assemble
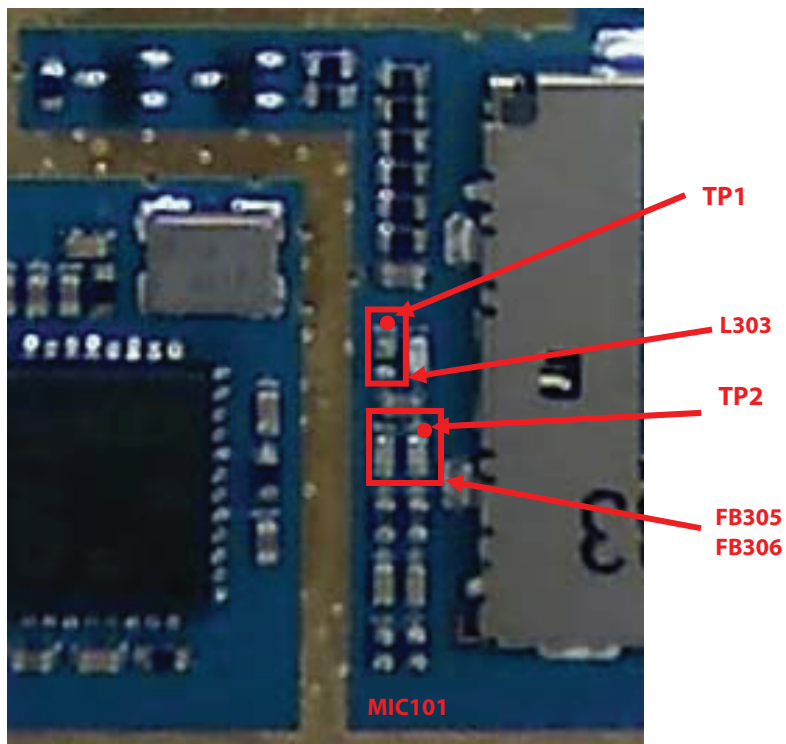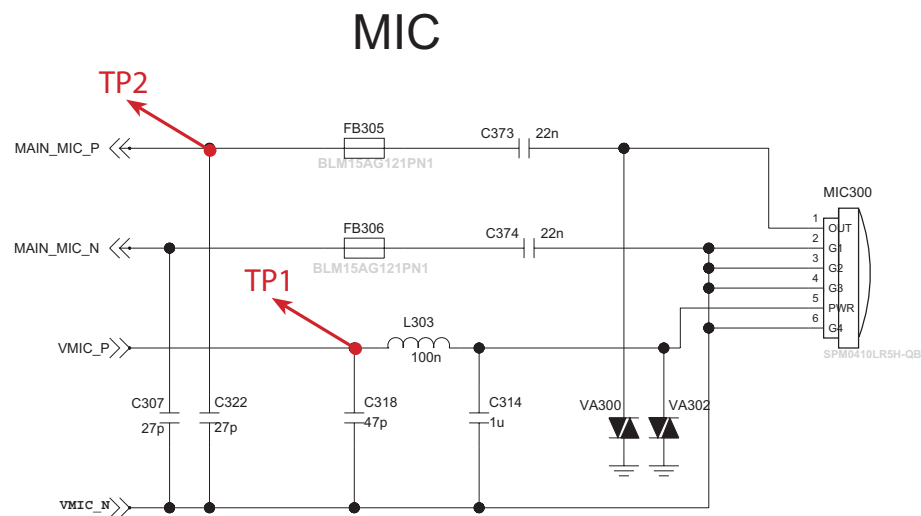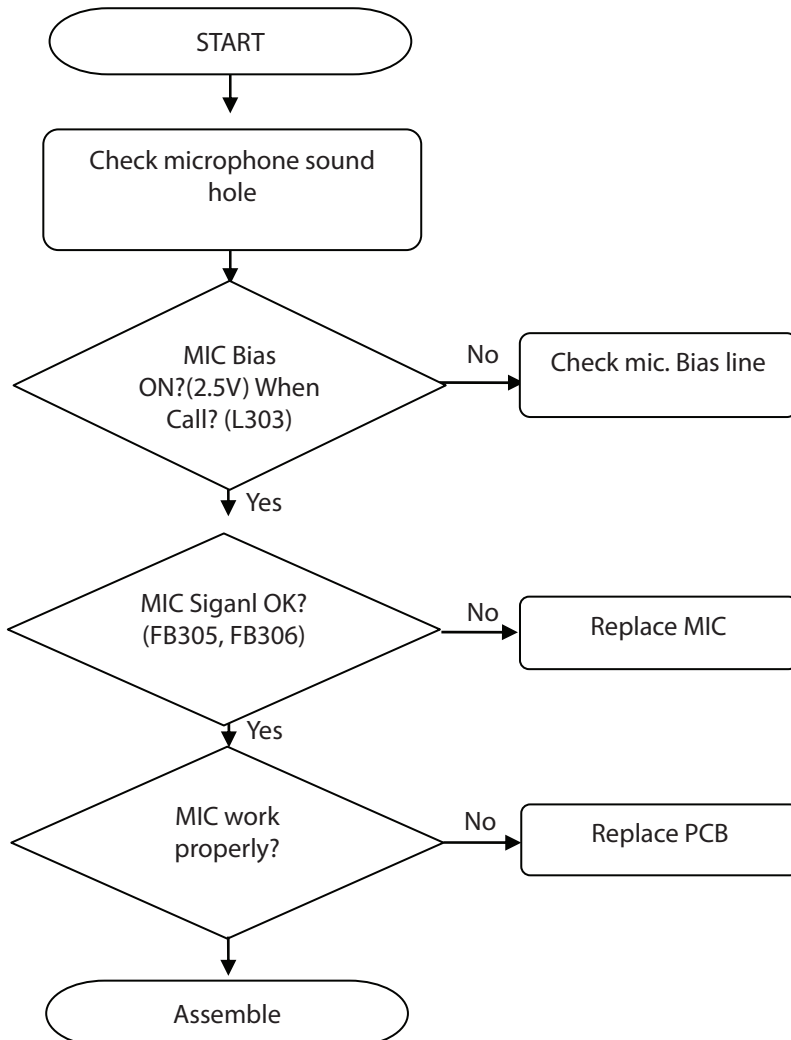
4.8 Vibrator trouble

Check Points

-Vibrator soldering

-IC is working correct

Vibrator

```
                    ┌─────────────────────┐
                    │       START         │
                    └─────────────────────┘
                               │
                               ▼
                    ┌─────────────────────┐
                    │ Check Vibrator contact│
                    └─────────────────────┘
                               │
                               ▼
                        ╱─────────╲
                       ╱  TP1(VBAT) ╲          No      ┌──────────────┐
                      ╱  of U302 and  ╲ ──────────────▶│ Check U302or │
                      ╲  TP2 is High?  ╱               │  replace it  │
                       ╲             ╱                 └──────────────┘
                        ╲─────────╱
                            │ Yes
                            ▼
                        ╱─────────╲
                       ╱ Check PWM ╲           No      ┌──────────────┐
                      ╱   Signal     ╲ ──────────────▶│Check U302&Q300│
                      ╲ (TP3&TP4)   ╱                 │  replace it   │
                       ╲         ╱                    └──────────────┘
                        ╲─────╱
                            │ Yes
                            ▼
                    ┌─────────────────────┐
                    │  Replace Vibrator   │
                    └─────────────────────┘
                               │
                               ▼
                    ┌─────────────────────┐
                    │      Assemble       │
                    └─────────────────────┘
```
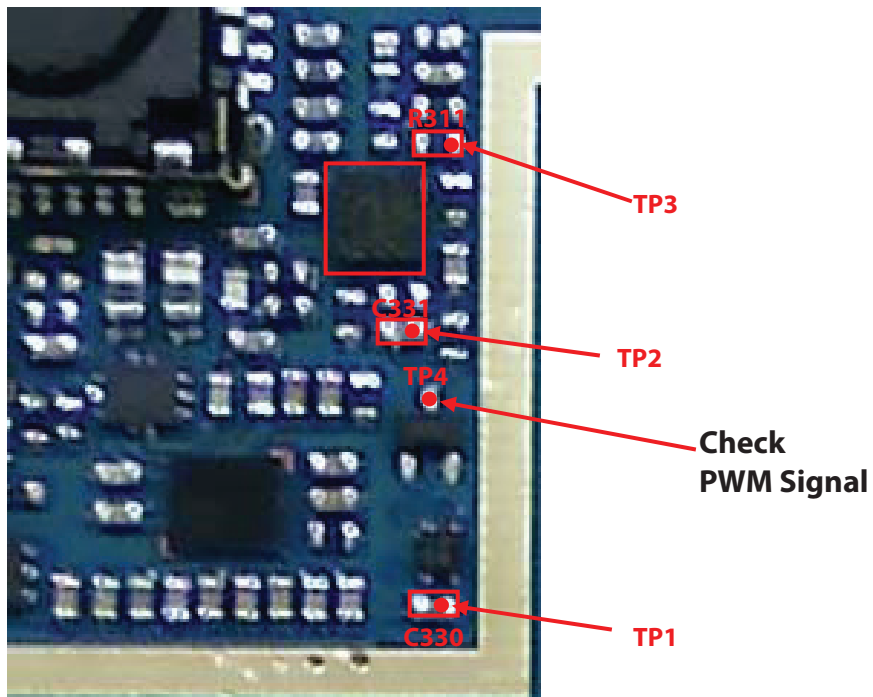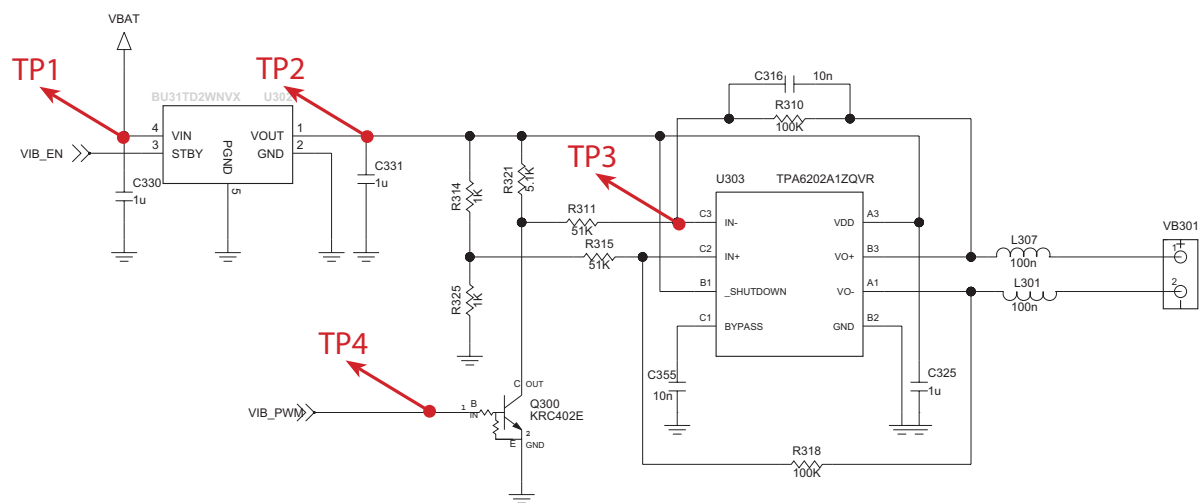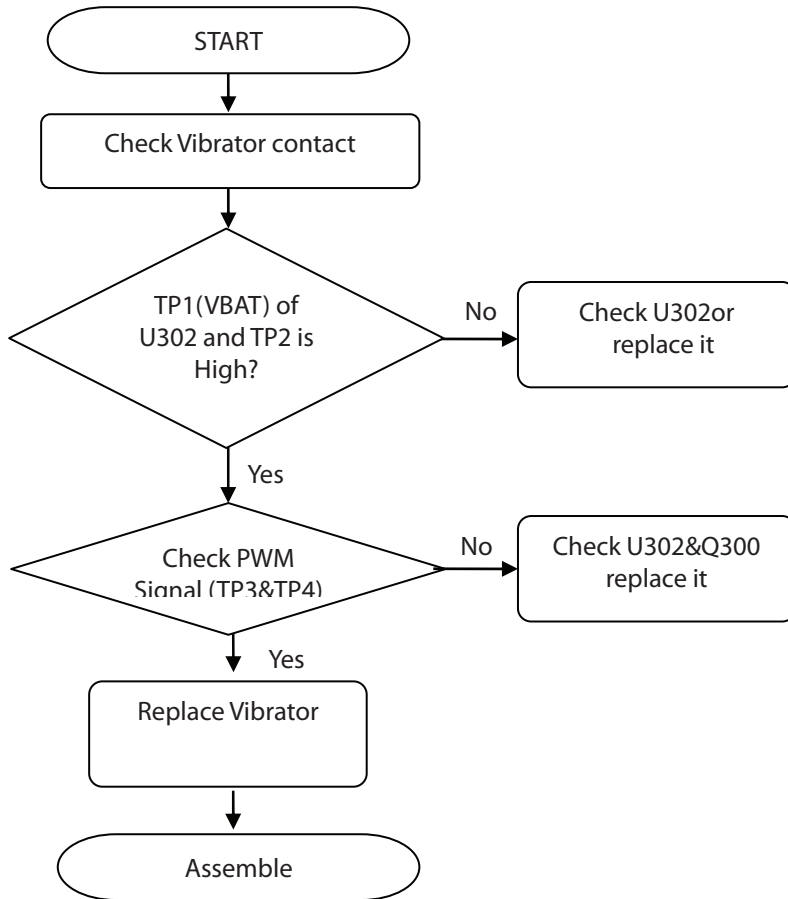
4.9 Keypad back light trouble

Check Points

-Signal path is connected well

KEY LED

```
                    ┌─────────────────┐
                    │      START      │
                    └────────┬────────┘
                             │
                             ▼
            ┌─────────────────────────────┐
            │   Check All of LEDs solder  │
            │                             │
            └──────────────┬──────────────┘
                           │
                           ▼
                        ╱───────╲                    ┌──────────────────────┐
                      ╱  Check    ╲        No         │        Check         │
                    ╱  TP1 is       ╲ ───────────────▶│  R402,R406,R413,R41  │
                      ╲  2.62V?    ╱                   │   6,R421,R422 &      │
                        ╲───────╱                     │    LD400~LD405       │
                           │                          └──────────────────────┘
                          Yes
                           ▼
                        ╱───────╲                    ┌──────────────────────┐
                      ╱  Check    ╲        No         │     Replace U202     │
                    ╱ PMIC(U202)    ╲ ───────────────▶│                      │
                      ╲           ╱                   └──────────────────────┘
                        ╲───────╱
                           │
                          Yes
                           ▼
            ┌─────────────────────────────┐
            │      Replace main board     │
            └──────────────┬──────────────┘
                           │
                           ▼
                    ┌─────────────────┐
                    │     Assemble    │
                    └─────────────────┘
```

TP1

    - 80 -
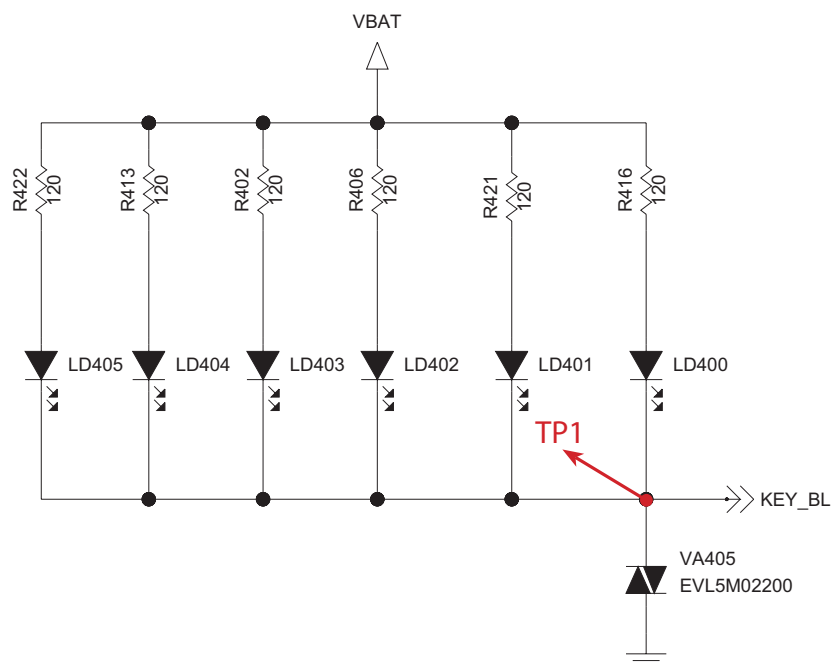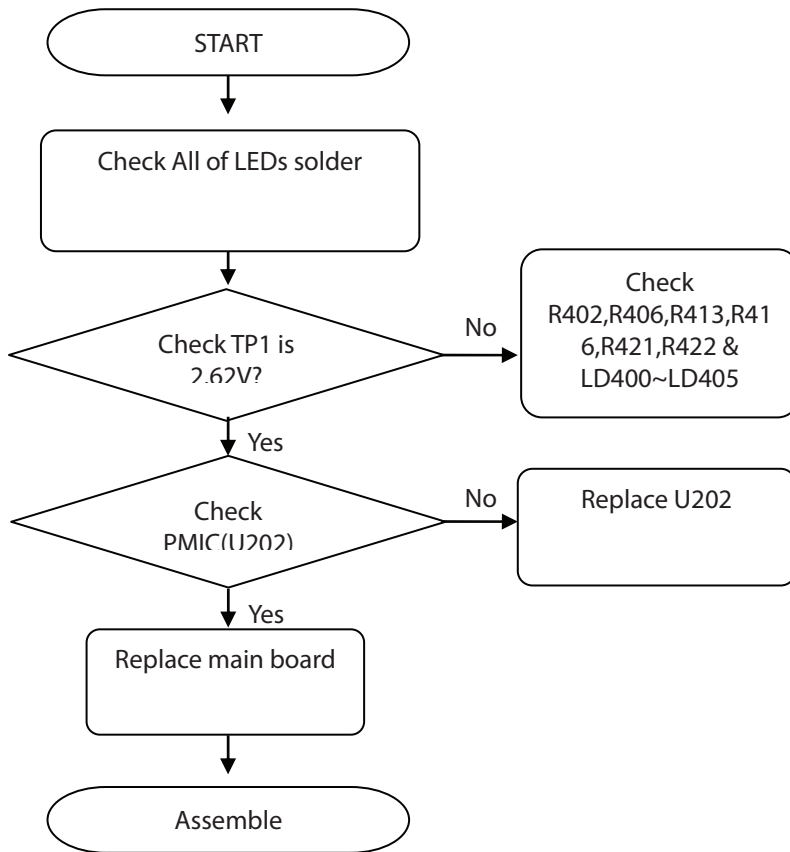
4.10 SIM & uSD trouble

SIM Check Points

-Power is working

-Socket soldering

-Proper SIM is used
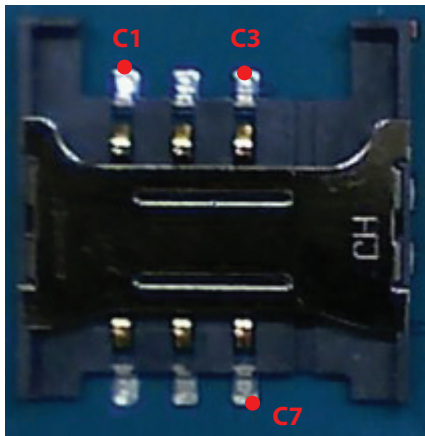
Check soldering all pin of socket

Pin C1 / 2V9_SIM

Pin C3 / SIM_CLK

Pin C7 / SIM_IO

SIM CONNECTOR

VSIM_2V9   VSIM_2V9   VSIM_2V9

J400

4	C5	C1	1
5	C6	C2	2
6	C7	C3	3
10	GND4	GND1	7
9	GND3	GND2	8

R407
10K

SIM_IO

C405
22p

GCA26D-6S-H18-E1500

SIM_RST
SIM_CLK

C401   C410 C409
0.1u   22p   DNI

START

Check All of SIM card voltage
GS290 support
2.9V SIM only

6 pins are
soldered well? — No → Resolder pin

Yes

Check Proper SIM
Card — Yes → Replace Main Board

Assemble
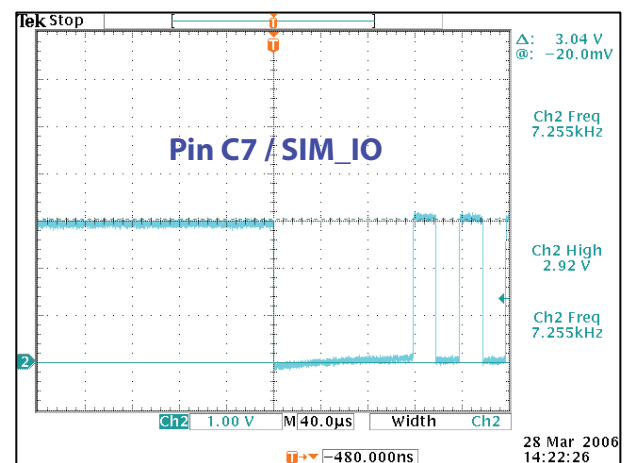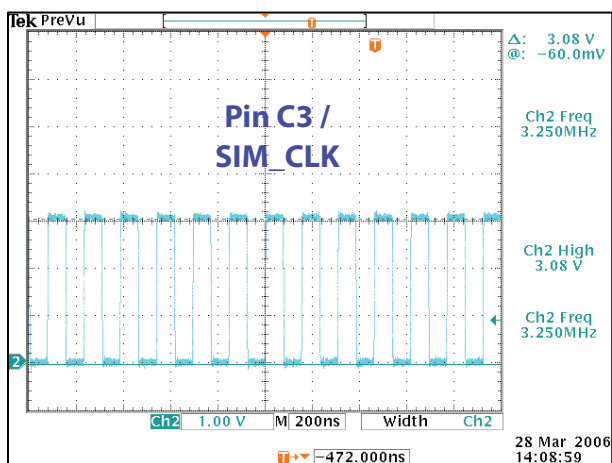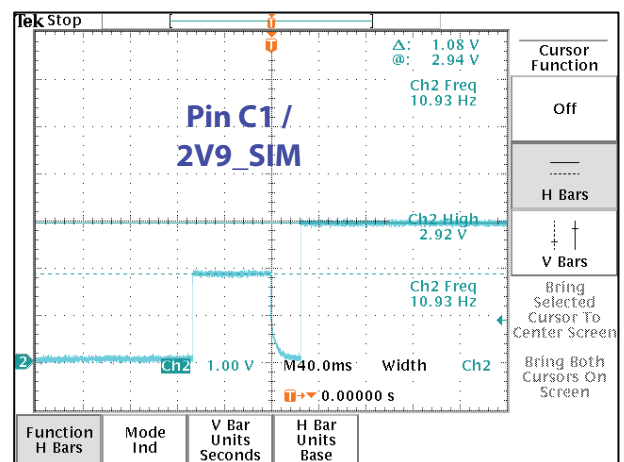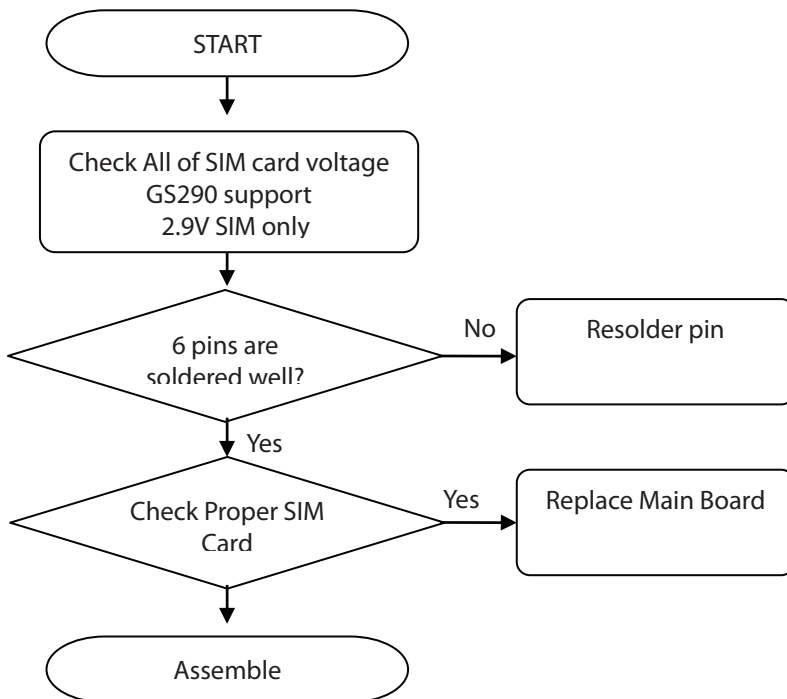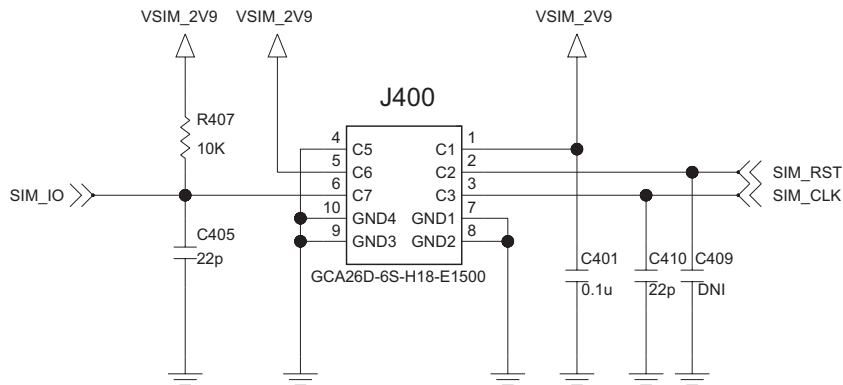
uSD Check Points

-Power is working

-Socket soldering

-Card detect is working

MMC-DETECT PIN

MMC_DETECT SIGNAL
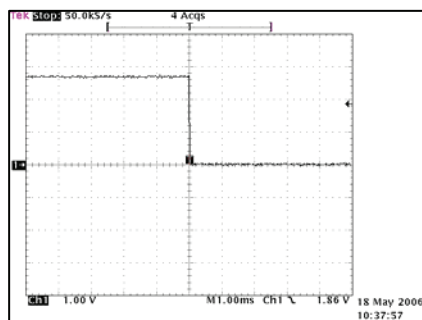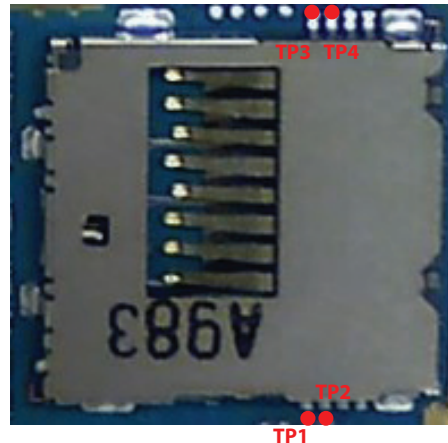
Card insert
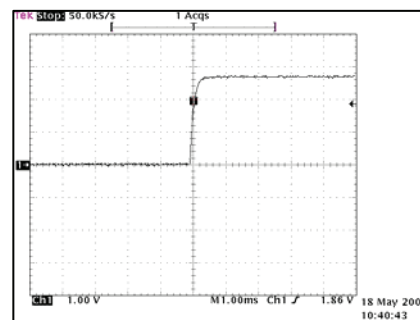
Card Deject

4. TROUBLE SHOOTING

```
         ┌─────────────────┐
         │      START       │
         └─────────────────┘
                  │
                  ▼
      ┌───────────────────────────┐
      │  Check Micro SD card voltage│
      │       (2V8_VMME)           │
      └───────────────────────────┘
                  │
                  ▼
            ╱──────────╲                          ┌─────────────────┐
           ╱  TF socket  ╲        No               │   Resolder it    │
          ╱  pins are well ╲──────────────────────▶│ (check data line │
           ╲  soldered     ╱                        │  TP 1~4 is 2.9V  │
            ╲──────────╱                            │     Signal)      │
                  │ Yes                             └─────────────────┘
                  ▼
            ╱──────────╲                          ┌─────────────────┐
           ╱  Check      ╲        Yes              │ Replace Main Board│
          ╱  proper       ╲──────────────────────▶│                  │
           ╲  uSD?        ╱                        └─────────────────┘
            ╲──────────╱
                  │
                  ▼
         ┌─────────────────┐
         │     Assemble     │
         └─────────────────┘
```
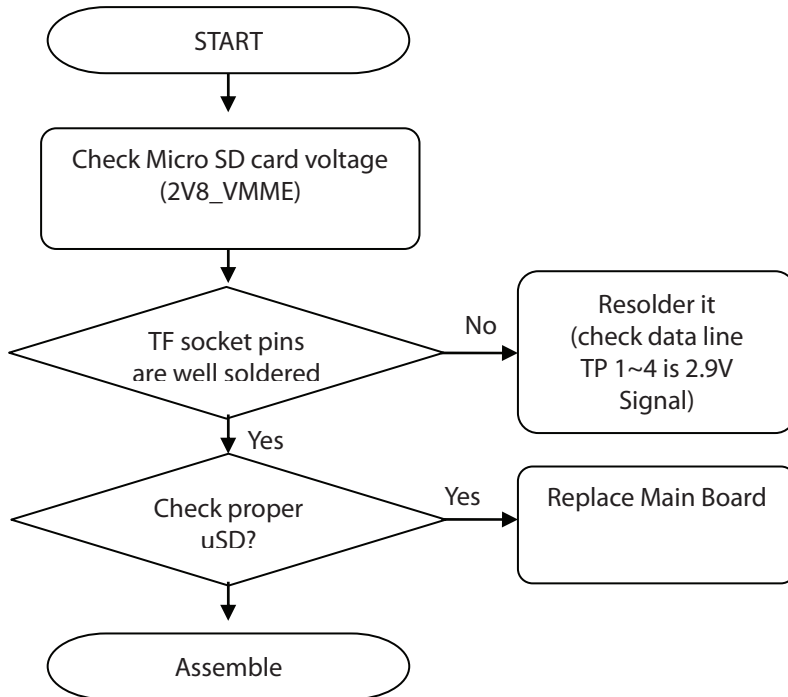
4.11 Touch trouble

Check Points

- Touch driver IC soldering`

- Touch connector Crack
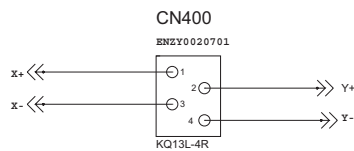
Touch Connector   ## Touch IC

4. TROUBLE SHOOTING

```
        ┌─────────────────────┐
        │       START          │
        └─────────┬───────────┘
                  │
                  ▼
        ┌─────────────────────┐
        │  Check Touch Signal  │
        │ (If not replace front│
        │    touch panel)      │
        └─────────┬───────────┘
                  │ Yes
                  ▼
            ◇ U400 Solder ◇ ──── No ──▶ ┌──────────────────┐
            ◇   check     ◇             │  Resolder U400   │
                  │                      └──────────────────┘
                  │ Yes
                  ▼
            ◇ CN400 Solder ◇ ─── No ──▶ ┌──────────────────┐
            ◇    check     ◇            │ Resolder or      │
                  │                      │ Replace CN400    │
                  │ Yes                  └──────────────────┘
                  ▼
        ┌─────────────────────┐
        │  Replacd Main Board  │
        └─────────────────────┘
```

U400

CN400
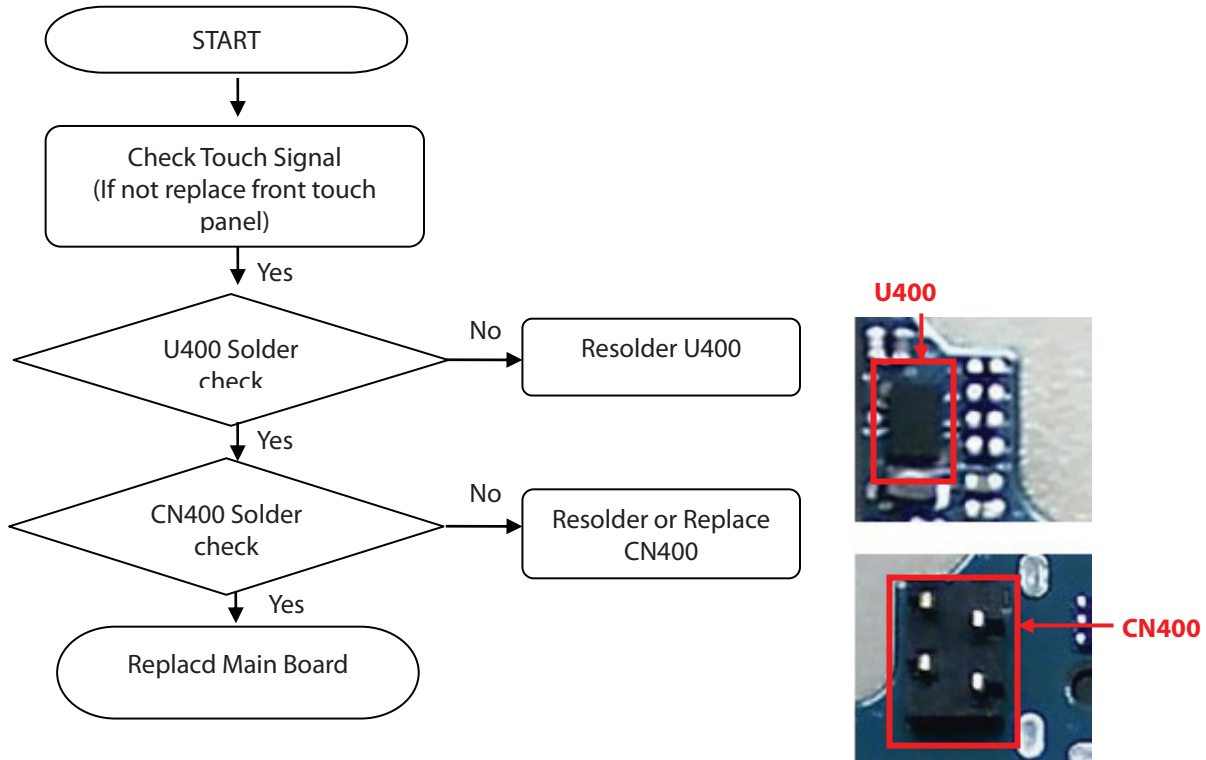
4.12 Trouble shooting of Receiver part

Checking Flow

```
        ┌─────────────────────┐
        │        START        │
        └─────────────────────┘
                  │
                  ▼
        ┌─────────────────────┐
        │ Setup Test Equipment │
        │ Cell Power : –74dBm │
        │    EGSM    CH30     │
        │     DCS CH699       │
        └─────────────────────┘
                  │
                  ▼
           ◇ Check point ①
             DCXO
                  │
                  ▼
           ◇ Check point  ②
             PLL Control
                  │
                  ▼
           ◇ Check point ③
             Mobile SW & FEM
                  │
                  ▼
           ◇ Check point ④
             RX I/Q Signal
                  │
                  ▼
        ┌─────────────────────┐
        │ Re-Download  S/W & CAL │
        └─────────────────────┘
```
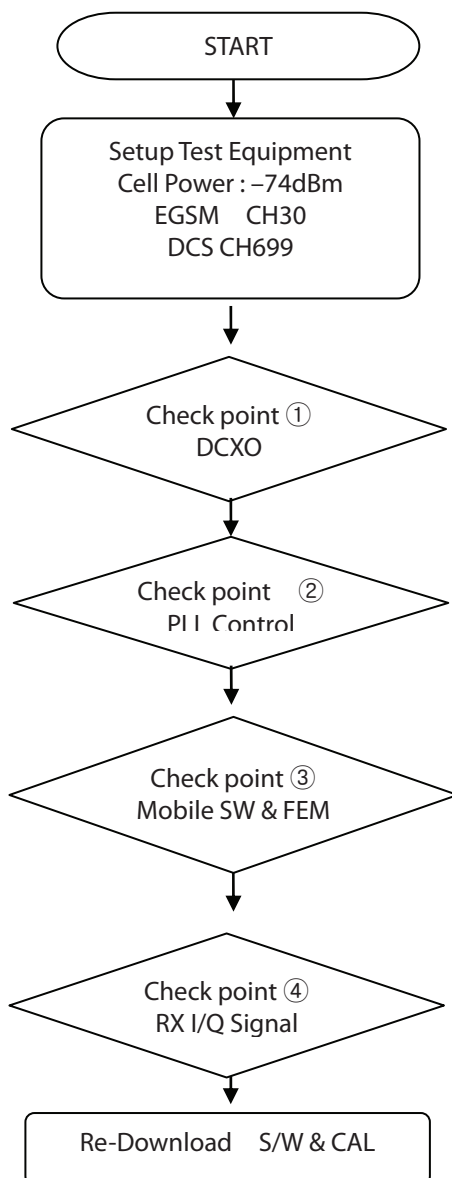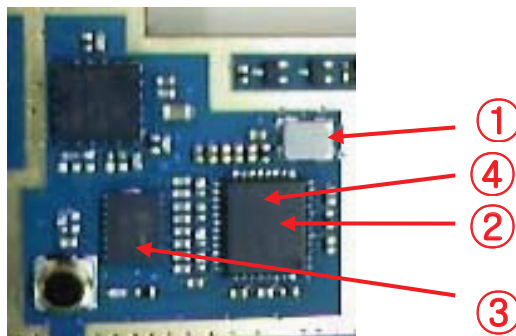
Checking Points

Figure 1.   Main PCB

4. TROUBLE SHOOTING

4.12.1. Checking DCXO Circuit

Checking Points

TP1(C516) : 26MHz

Figur2.   DCXO

Checking Flow

Is the waveform of TP1(C516) similar to Fig.4? — No → Replace X500

↓ Yes

DCXO Circuit is OK. See next page to check PLL Circuit.
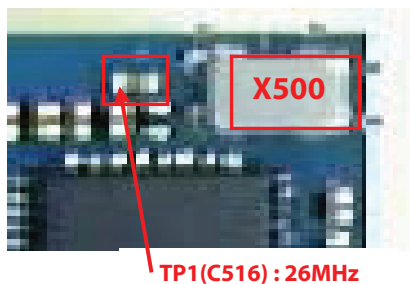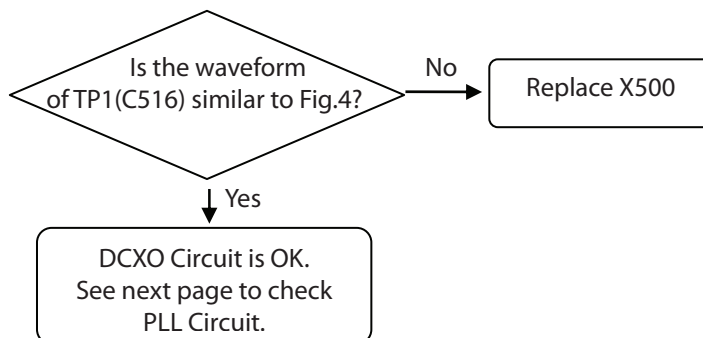
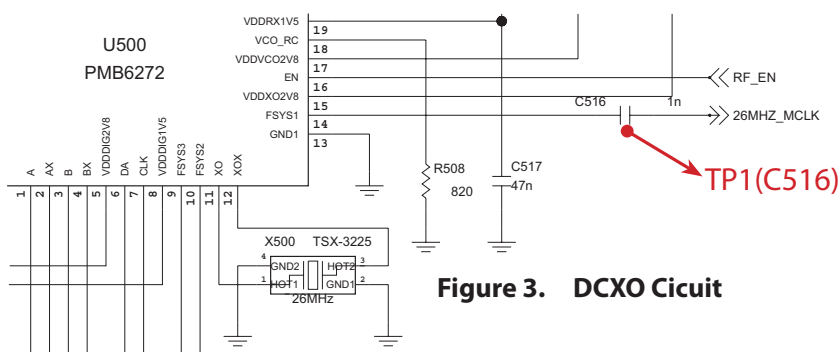### DCXO Circuit Diagram

Figure 3.   DCXO Cicuit

Waveform
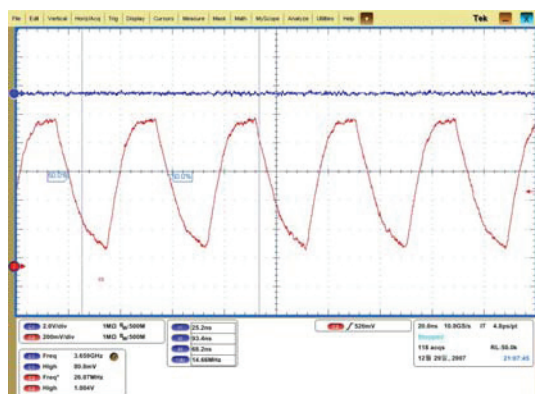
Figure 4.   DCXO Waveform

4.12.2. Checking PLL Control signals

Checking Points

TP1 (RF_EN)   TP3 (RF_CLK)

TP2 (RF_DATA)

U601
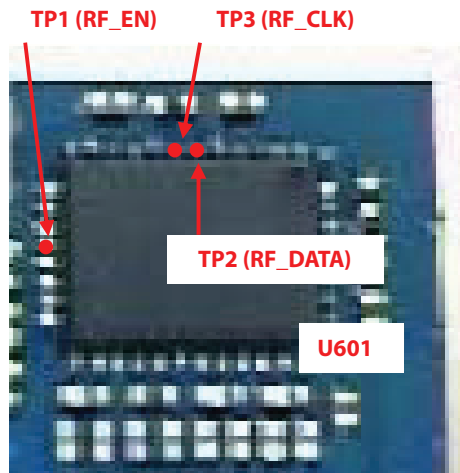
Figure 5.   Transceiver
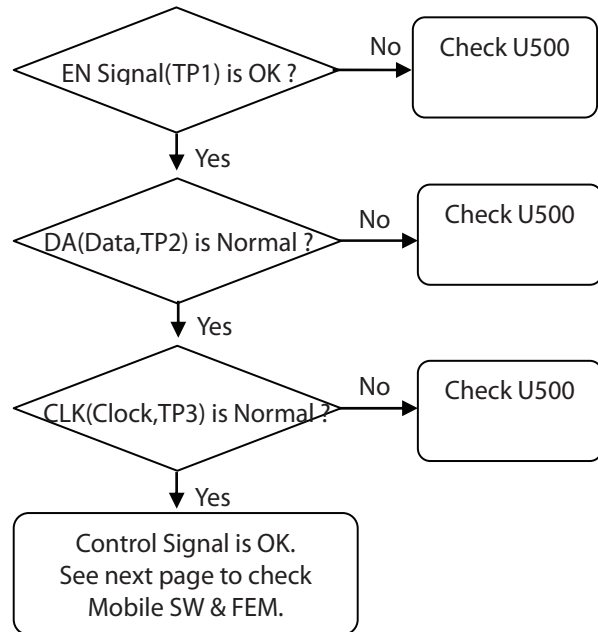
RF Transceiver   Circuit Diagram
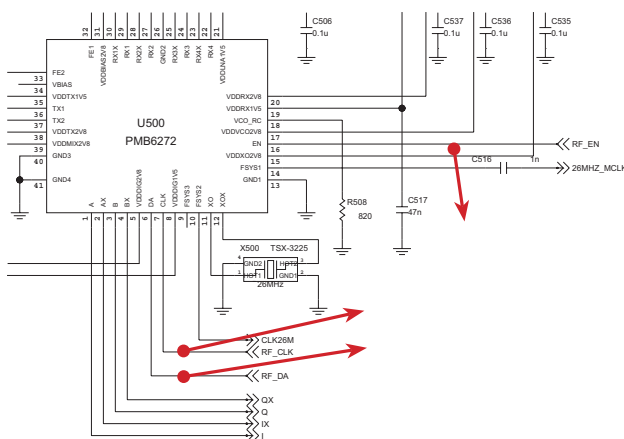
Figure 6.   Transceiver Circuit

Checking Flow
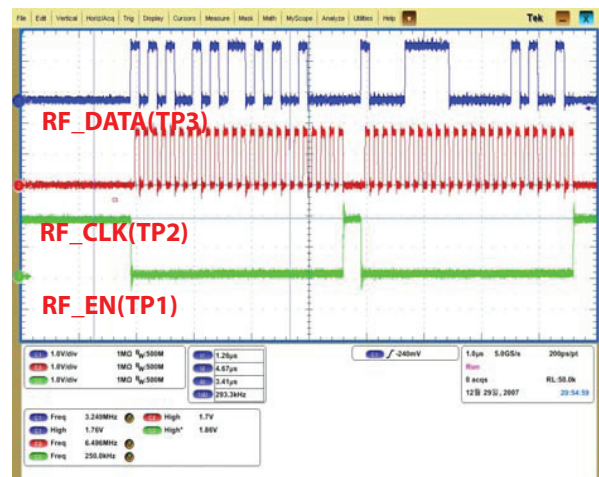
Waveform

Figure 7.   PLL Control Waveform

4.12.3 Checking Mobile SW & FEM

Mobile SW & FEM Circuit Diagram
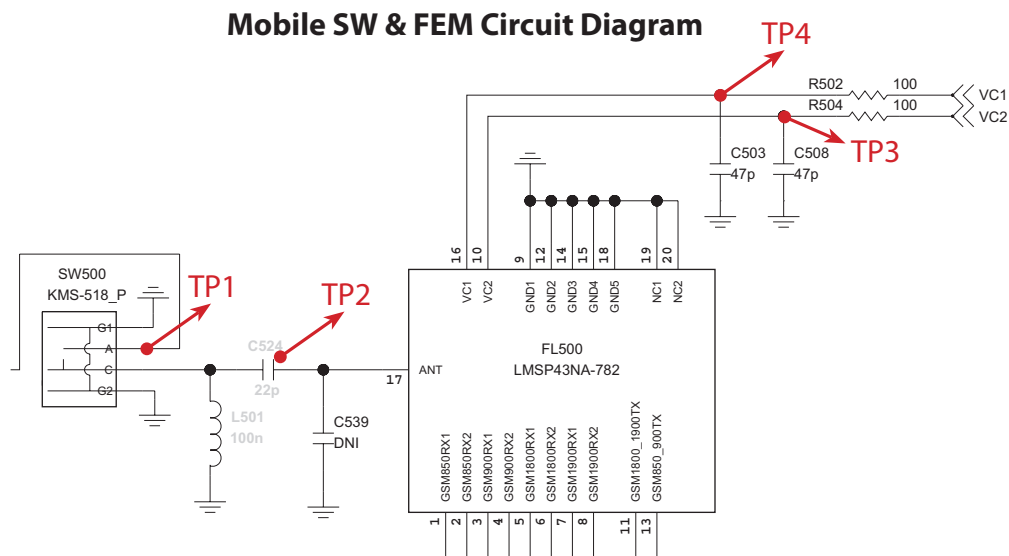
Figure 8.   Mobile SW & FEM Circuit

Checking Points
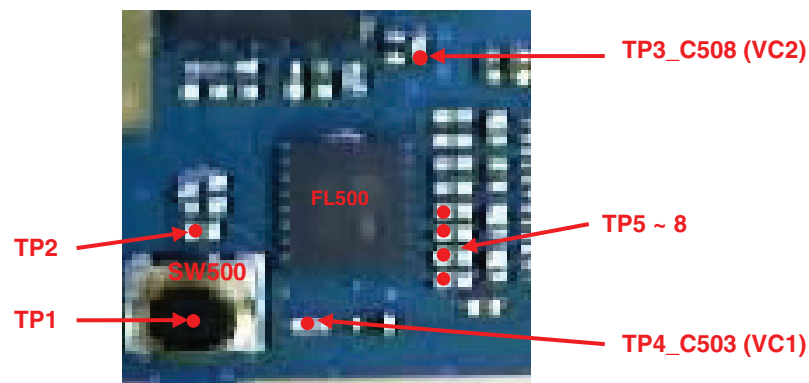
Figure 9.   Mobile SW & FEM

	EGSM/GSM850	DCS/PCS
VC1	OFF	OFF
VC2	OFF	OFF

Table 2. FEM RX Control Logic

Checking Flow

```
        ┌─────────────────────────────┐
        │   Check TP1 of SW500         │
        │   with RF Cable and TP2 of C524 │
        └─────────────────────────────┘
                     │
                     ▼
              ╱───────────╲              No    ┌──────────────────────────┐
             ╱ TP1 Signal same╲ ───────────────▶│ Replace Mobile SW (SW500) │
             ╲   as TP2?     ╱                  └──────────────────────────┘
              ╲───────────╱
                     │ Yes
                     ▼
        ┌─────────────────────────────┐
        │   Check TP3, TP4 of FL500 ?  │
        └─────────────────────────────┘
                     │
                     ▼
              ╱───────────╲              No    ┌──────────────────────────┐
             ╱ Control Signal is╲ ─────────────▶│      Replace U100         │
             ╲     OK ?        ╱                 └──────────────────────────┘
              ╲───────────╱
                     │ Yes
                     ▼
              ╱───────────╲              No    ┌──────────────────────────┐
             ╱ TP5~8 Signal is ╲ ────────────▶ │   Replace FEM (FL500)     │
             ╲     OK ?        ╱                └──────────────────────────┘
              ╲───────────╱
                     │ Yes
                     ▼
        ┌─────────────────────────────┐
        │   Mobile SW & FEM is OK.     │
        │   Check Antenna.             │
        └─────────────────────────────┘
```
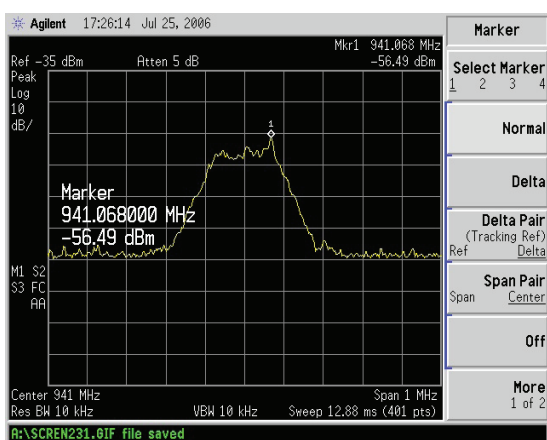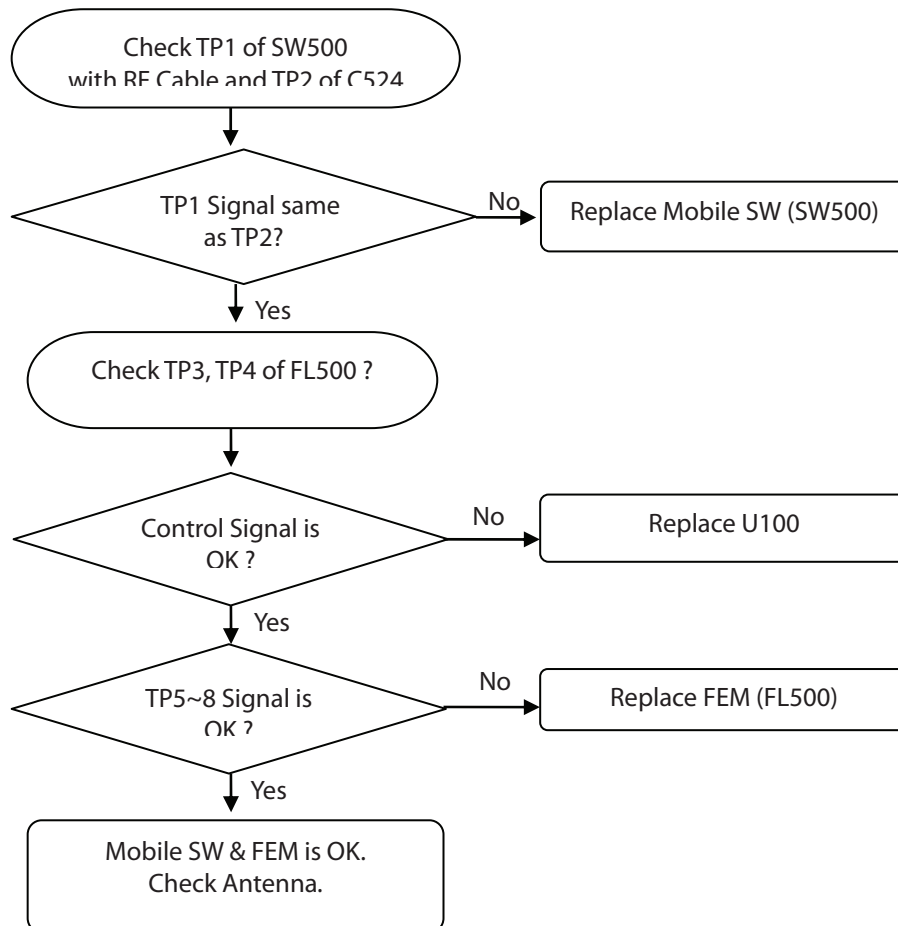
Figure 10   Mobile SW (R403)
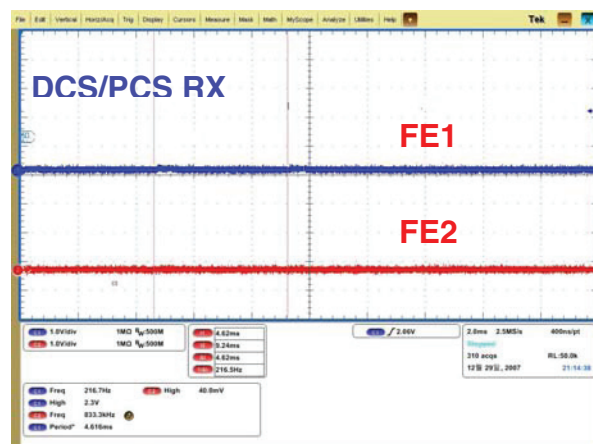
Figure 11   FEM Control Signals

LGE Internal Use Only

4.12.4. Checking RX I/Q Signals
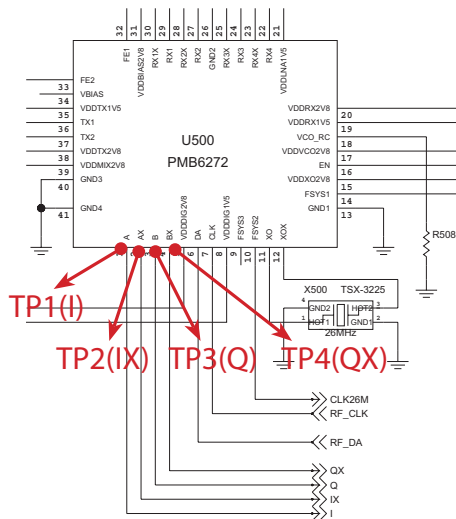
Figure 12. RX I/Q   Circuit

Checking Flow

Check RX I/Q signals(TP1~TP4)

Signals are Normal?

No → Replace Transceiver PMB6272(U500)

Yes ↓

RX Part   is OK.
Check Base Band Circuit
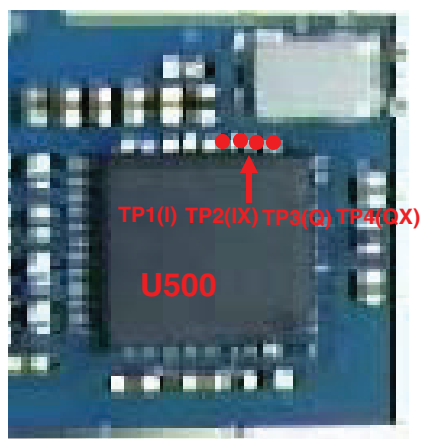or
Re-Download S/W and Cal
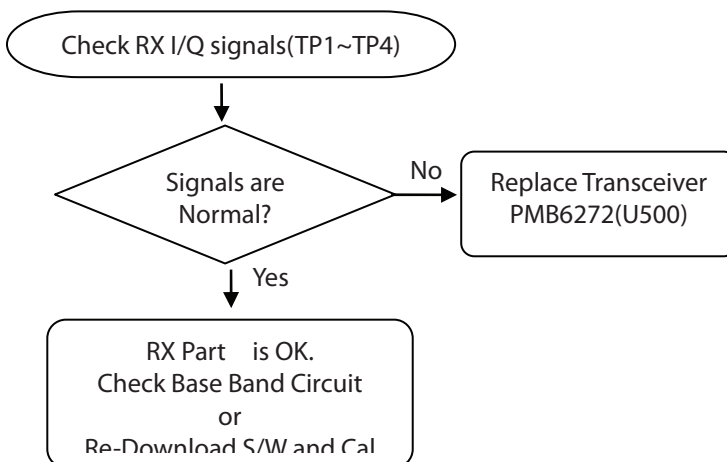
Checking Points

Figure 13. RX I/Q
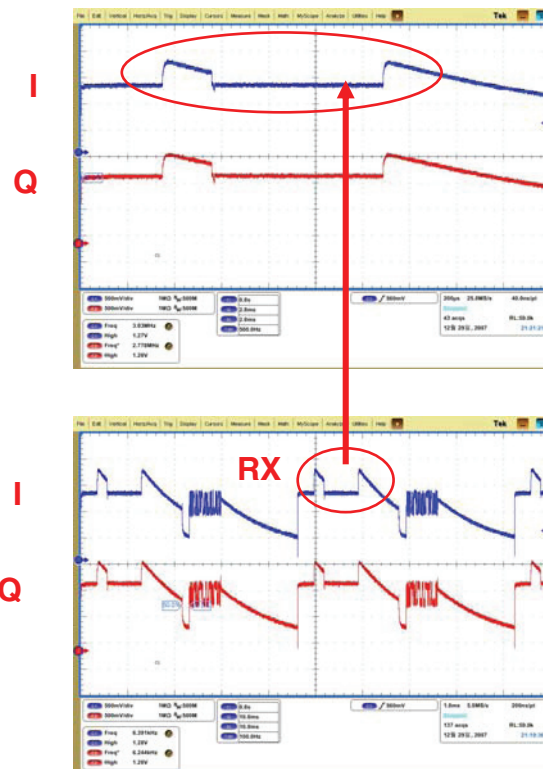
Figure 14. RX I/Q Waveform

4.13 Trouble shooting of Transmitter part.

Checking Flow

```
┌─────────────────────────┐
│   Setup Test Equipment   │
│   Cell Power : –74dBm    │
│      EGSM    CH30        │
│       DCS CH699          │
└─────────────────────────┘
            │
            ▼
      ◇ Check point ①
          DCXO ◇
            │
            ▼
      ◇ Check point ②
          PLL Control ◇
            │
            ▼
      ◇ Check point ③
          TX I/Q Signal ◇
            │
            ▼
      ◇ Check point ④
          Transceiver ◇
            │
            ▼
      ◇ Check point ⑤
          PAM Control ◇
            │
            ▼
      ◇ Check ⑥
          FEM & Mobile SW ◇
            │
            ▼
┌─────────────────────────┐
│  Re-Download S/W & RF CAL │
└─────────────────────────┘
```
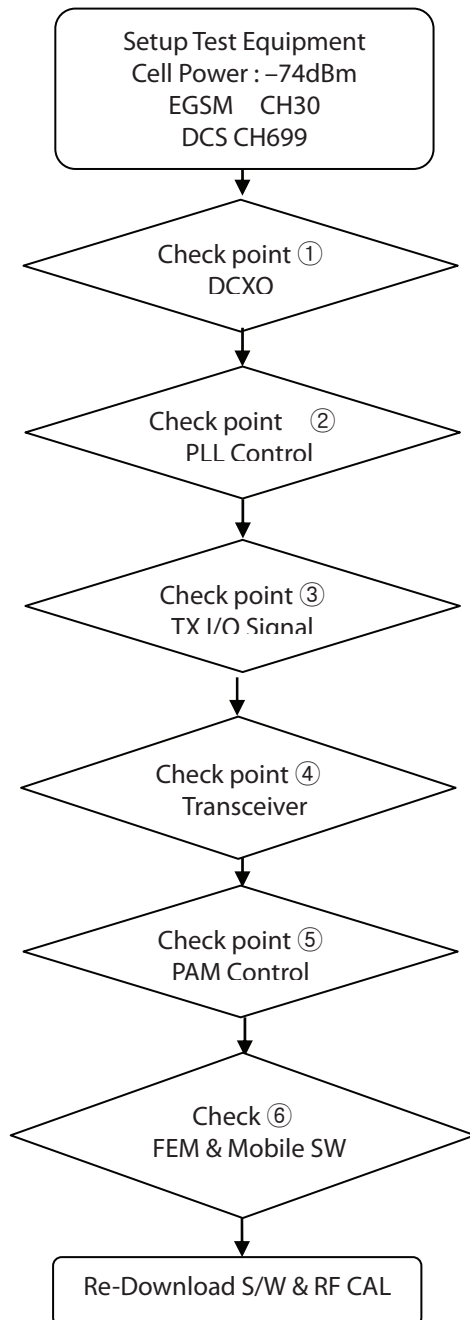
Checking Points

Figure 1.   Main PCB

4.13.1. Checking VCTCXO Circuit

See RX Part "1. Checking DCXO Circuit"

4.13.2. Checking PLL Control Signal

See RX Part "2. Checking   PLL Control Signal"

4.13.3. Checking TX I/Q Signals
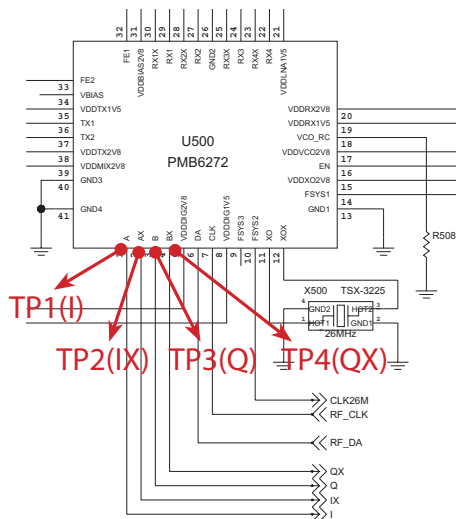
Figure 17.   TX I/Q   Circuit

Checking Flow

Check TX I/Q Signals(TP1~TP4)
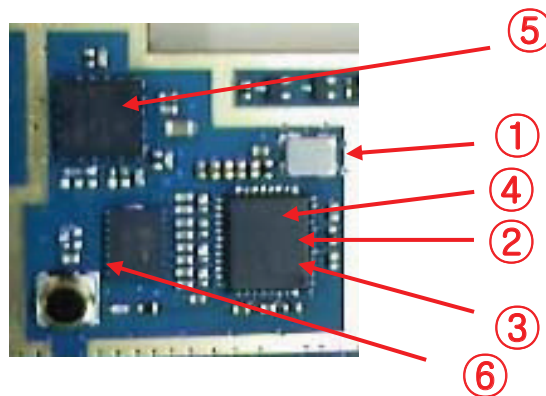
Signals are Normal ?

No → Replace Transceiver PMB6272(U500)

Yes

TX Part is OK.
Check Base Band Circuit or
Re-Download S/W and Cal

Checking Points

TP1(I) TP2(IX) TP3(Q) TP4(QX)

U500

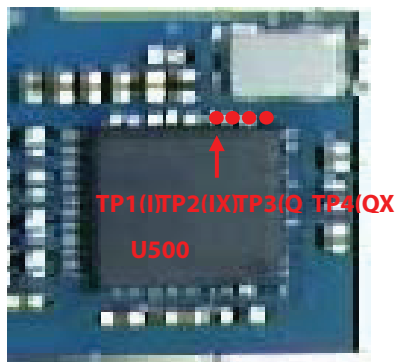**Figure 18. TX I/Q**

I

Q

I

Q

TX
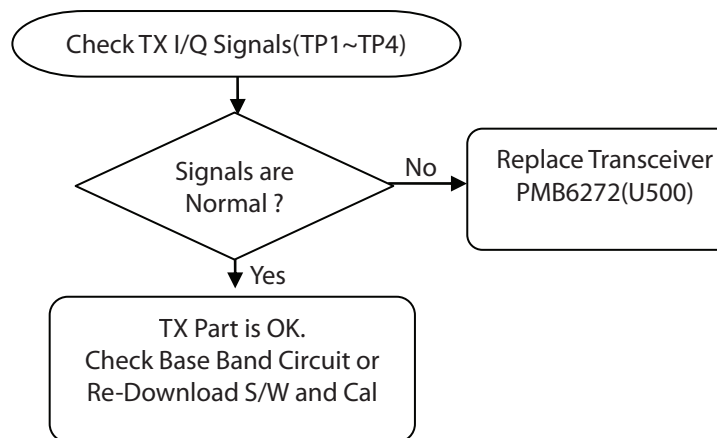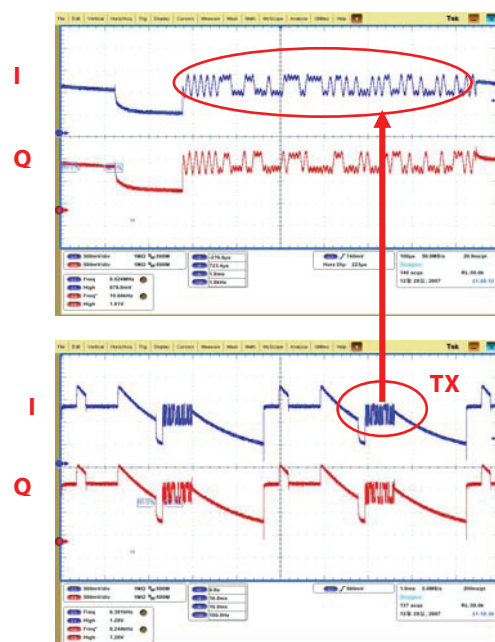
Figure 19. TX I/Q Waveform

4.13.4. Checking Transceiver Output Signals
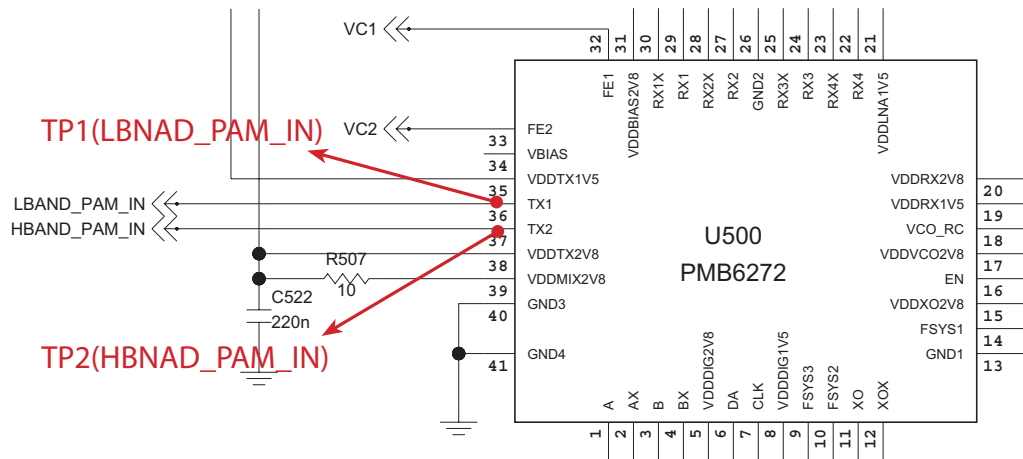
Figure 20. Transceiver Output   Circuit

Checking Points
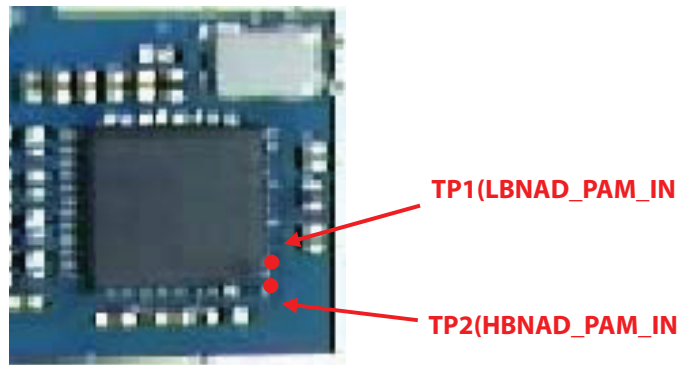
Figure 21. Transceiver Output

Table 3. Transceiver Output Operation

MODE	Transceiver Output
GMSK	Fixed
8PSK	Ramp Burst Control

4. TROUBLE SHOOTING

Checking Flow

Check Output Signal
(TP1, TP2)

Signals are
Normal ?

No → Replace
PMB6272(U500)

Yes

Transceiver is OK.
See next page to check
PAM Control Circuit.
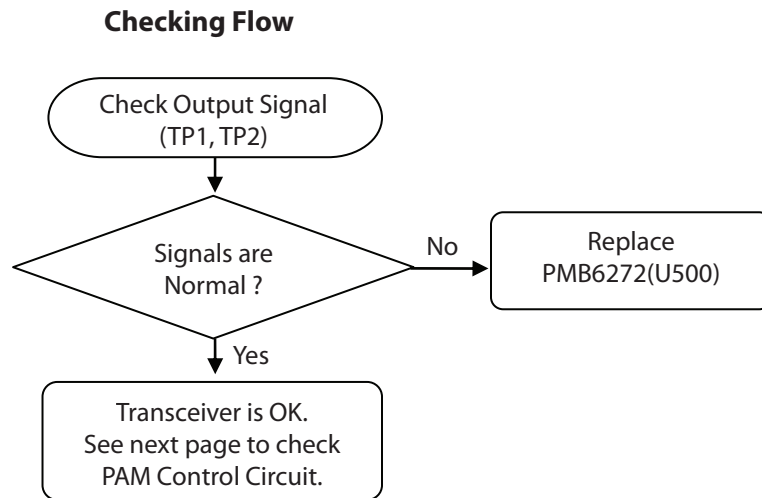
LBAND_PAM_IN (MODE: GMSK) : TP1
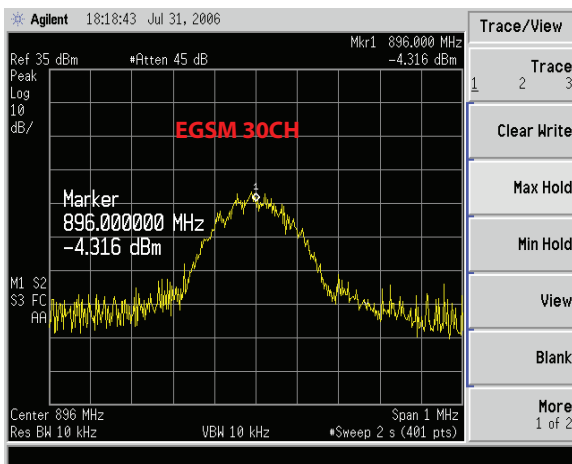
Figure 22.   Transceiver Output (GMSK)

LBAND_PAM_IN (MODE: 8PSK) : TP1
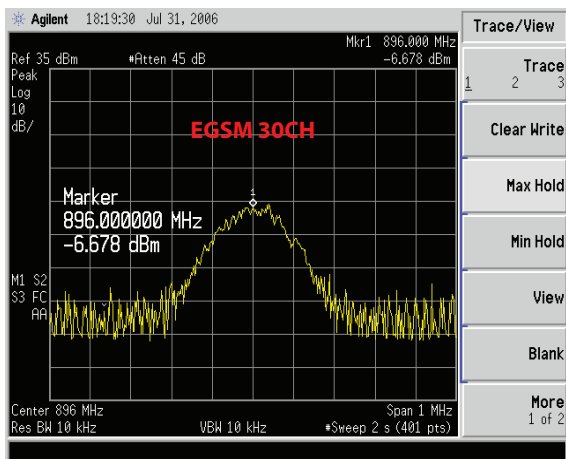
Figure 23.   Transceiver Output (8PSK)

13.5. Checking PAM Control Signals
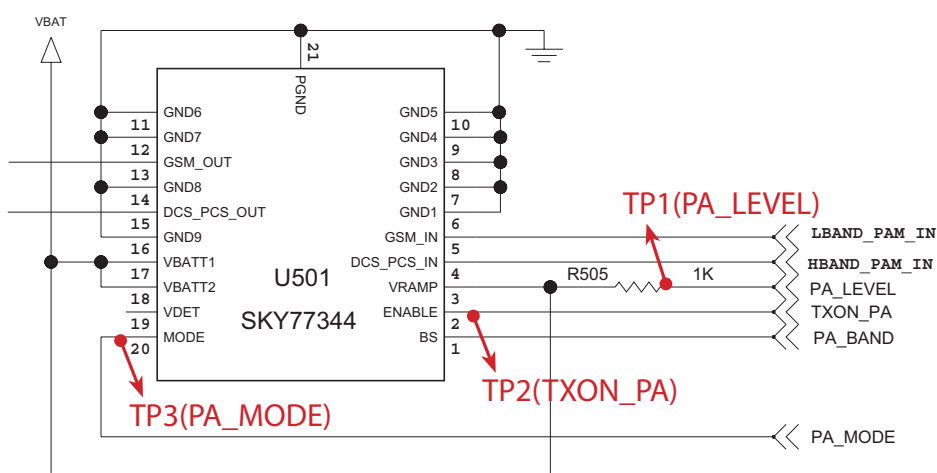
Figure 24.   PAM Control Signals Circuit

Checking Points
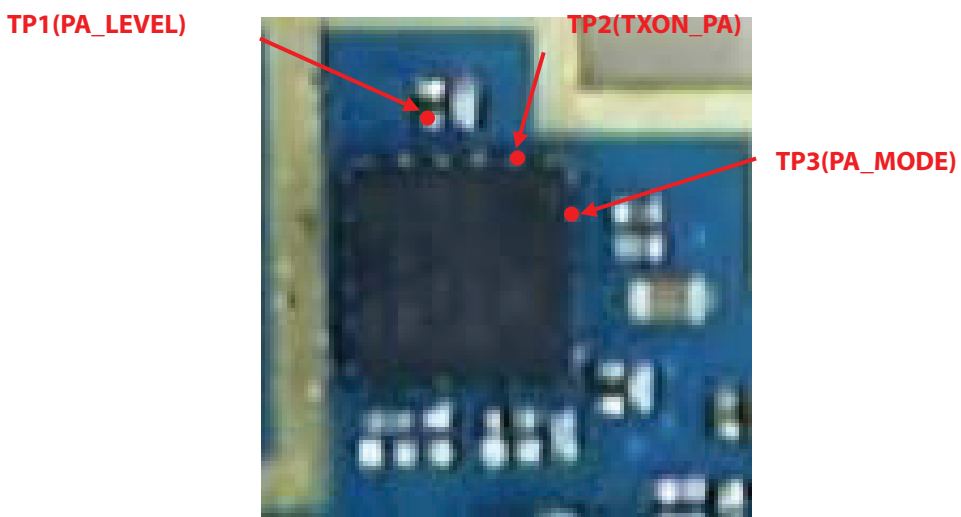
Figure 25.   Transceiver Output

Table 4. PAM Mode Operation

MODE	MODE	PA_LEVEL	TXON_PA
GMSK	LOW	Ramp Burst Control	HIGH
8PSK	HIGH	Control Amp bias	HIGH

Checking Flow

Check Control Signals
(TP1, TP2, TP3)

Signals are
Normal ?

No → Check
PMB8877(U100)

Yes

PAM Control Signal is OK.
See next page to check
FEM & Mobile SW Circuit.

Figure 26.   GSMK Control Signal

TP1(PA LEVEL)
TP2(TXON PA)
TP3(PA MODE)

TP1(PA LEVEL)
TP2(TXON PA)
TP3(PA MODE)
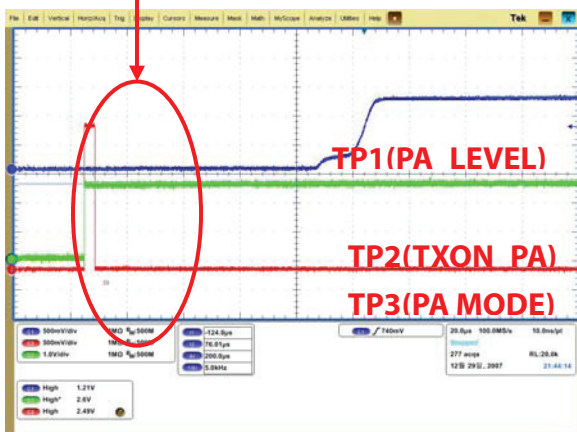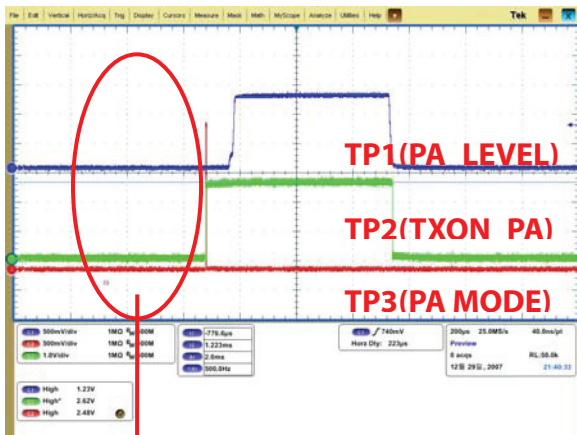
Figure 27.   8PSK Control Signal

TP2(TXON PA)
TP1(PA LEVEL)
TP3(PA MODE)
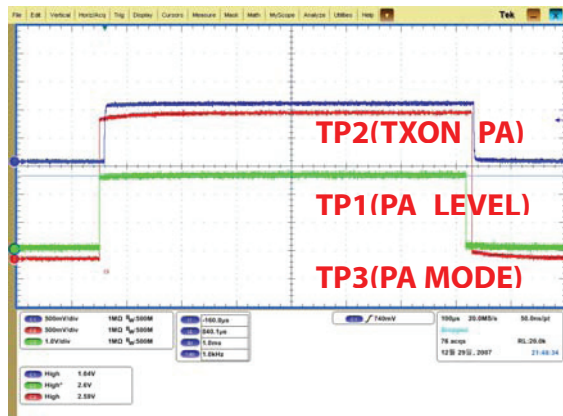
4.13.6 Checking Mobile SW & FEM

Mobile SW & FEM Circuit Diagram
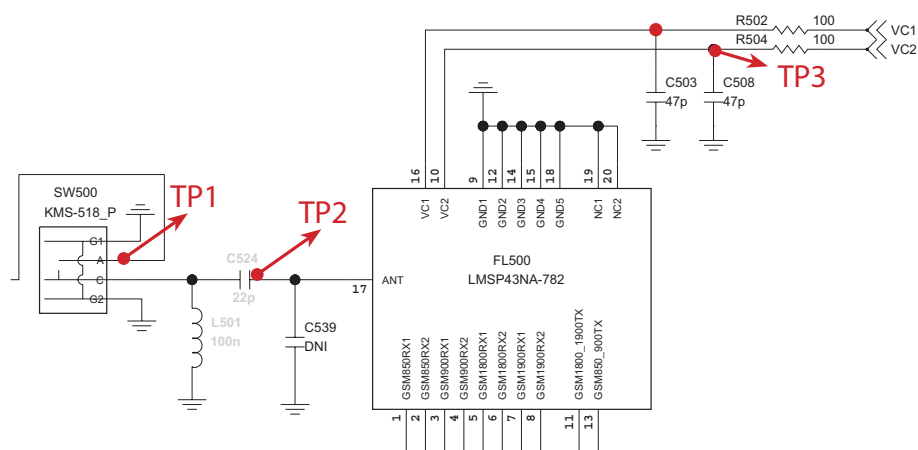
Figure 8.   Mobile SW & FEM Circuit

Checking Points
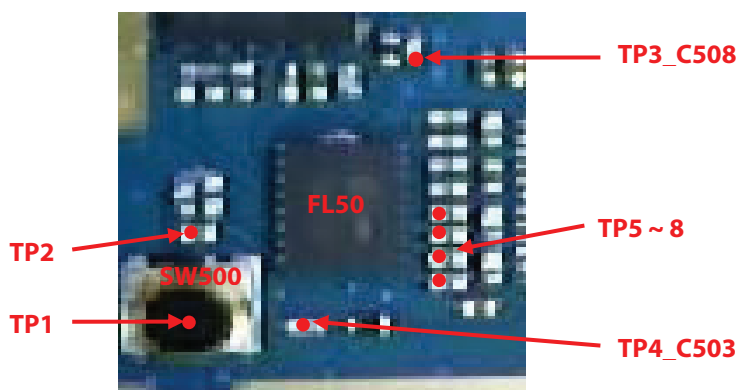
Figure 9.   Mobile SW & FEM

Table 2. FEM TX Control Logic

	EGSM/GSM850	DCS/PCS
VC1	ON	OFF
VC2	OFF	ON

Checking Flow

Check TP1 of SW500
with RF Cable and TP2 of C524

↓

TP1 Signal same
as TP2? → No → Replace Mobile SW (SW500)

↓ Yes

Check TP3, TP4 of FL500 ?

↓

Control Signal is
OK ? → No → Replace BB CHIP (U100)

↓ Yes

TP5 Signal is OK ? → No → Replace FEM (FL500)

↓ Yes

Mobile SW & FEM is OK.
Check Antenna.
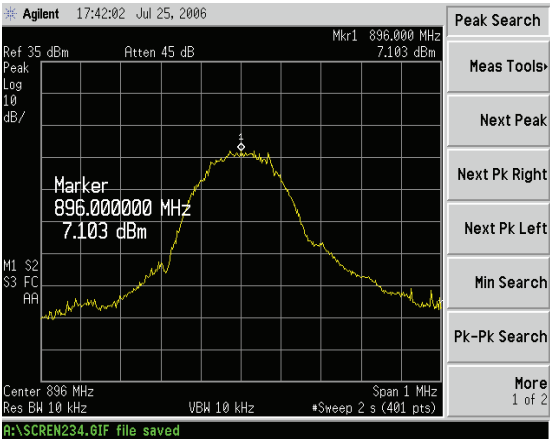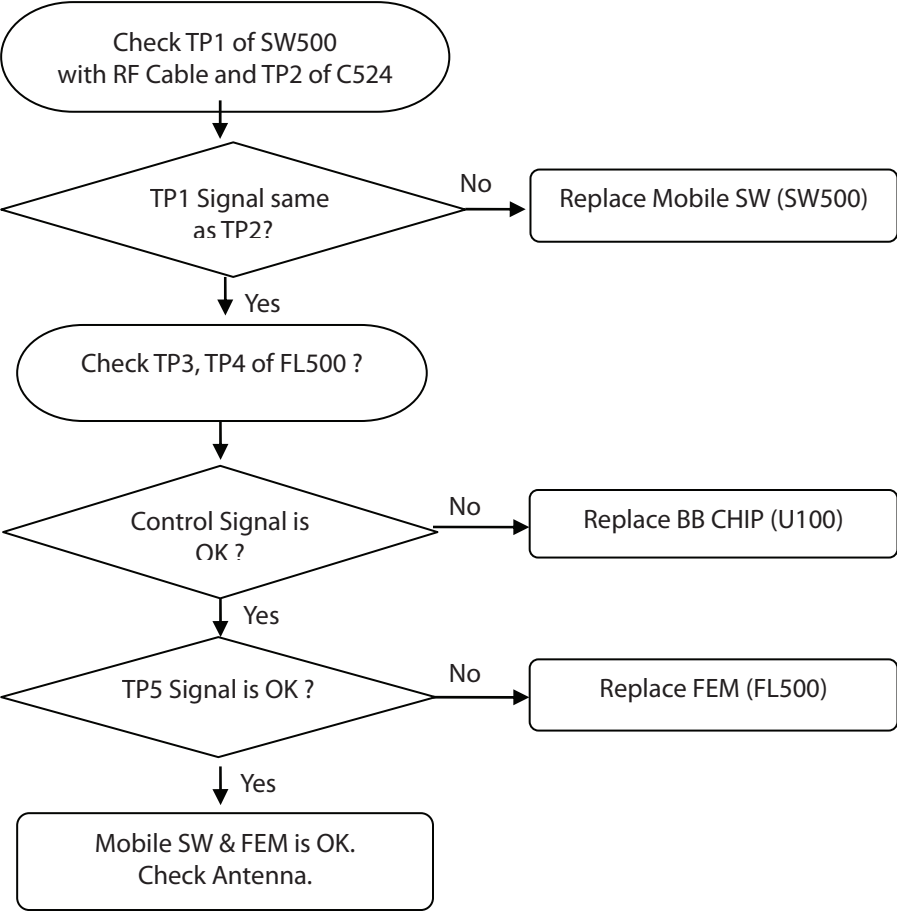
Figure 30　Mobile SW (R403)
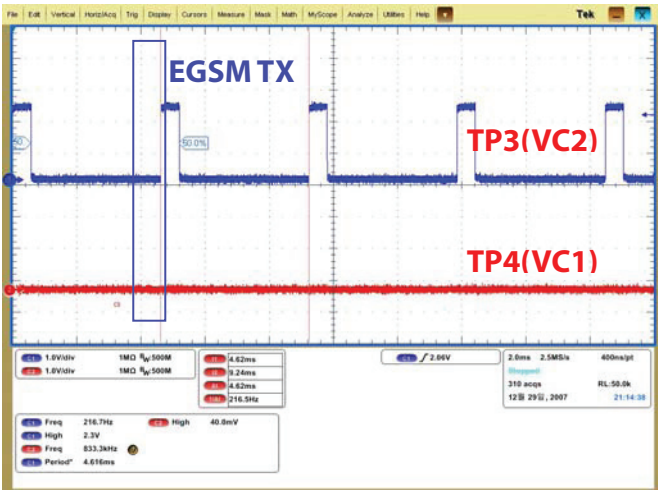
Figure 31　FEM Control Signals
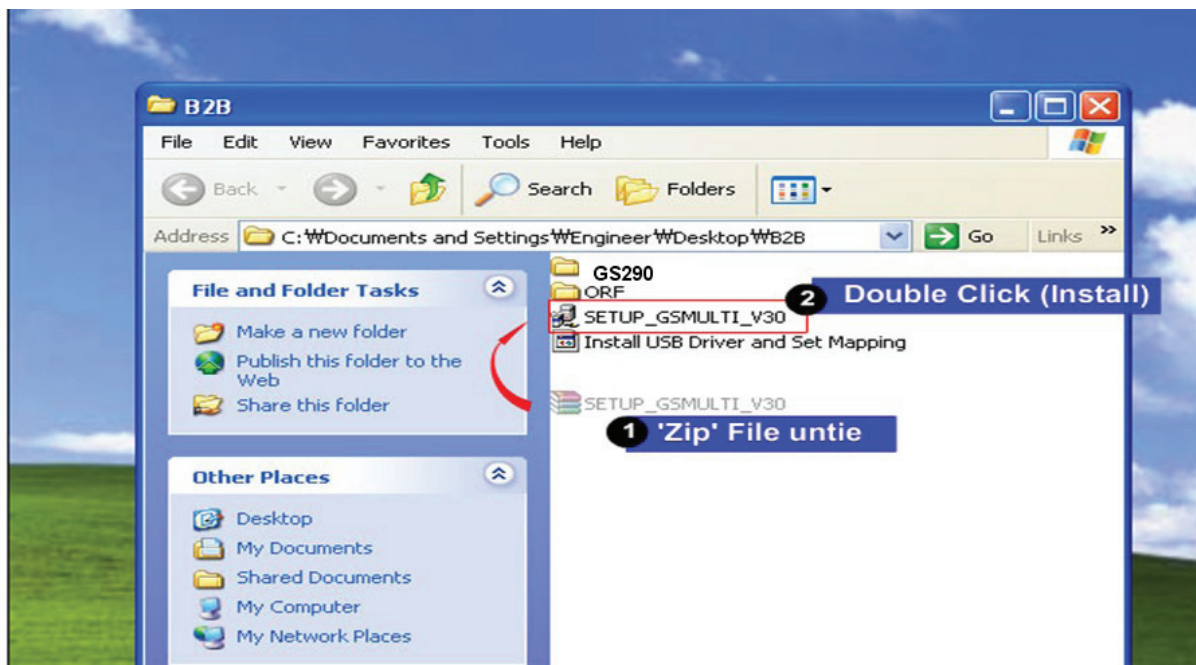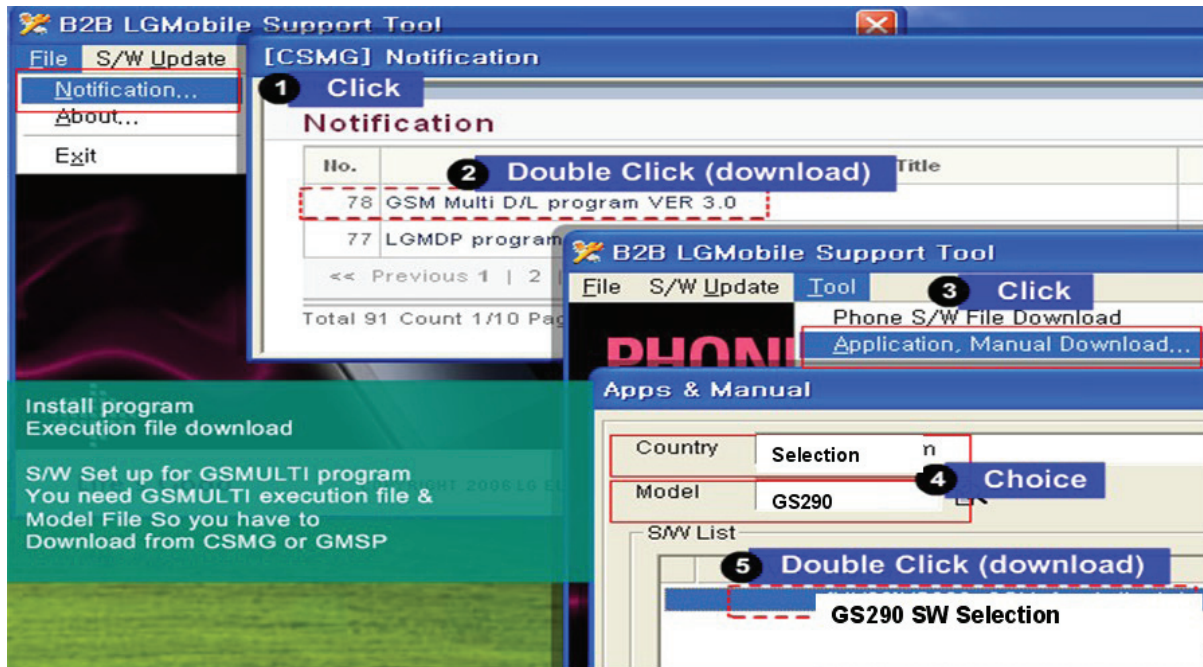
5. DOWNLOAD & S/W UPGRADE

5. DOWNLOAD & S/W UPGRADE

- 104 -

"Remove the Phone and I/O Cable"

5. DOWNLOAD & S/W UPGRADE

"Phone and I/O Cable" Connect

"Remove the Phone and I/O Cable"

5. DOWNLOAD & S/W UPGRADE

"Phone and I/O Cable" Connect

LG-GSM Multi Download [Ver 3.0]

File(F)   Setting(S)   About(H)

START   Model :   GS290   SW Version :   GS290 S/W

COM 1

Transmission amount

[BIN] 2%   4 s

Start Download
Start boot process.
Device synchronized.
Boot-loader is active
EBL version: NOT RELEASED 65535..65535   <<< When it's execution-screen.
Boot mode is: DD
Using: Faster CRC, Writing all blocks , Skip data CF
Package length is 16384
Baud rate set to 921600
Get flash id.
Flash ID is: 00000000
Boot process finished
Sending sec-pack.
Load region 0
Sending data.

- 111 -   LGE Internal Use Only

6. BLOCK DIAGRAM

GS290 BLOCK DIAGRAM
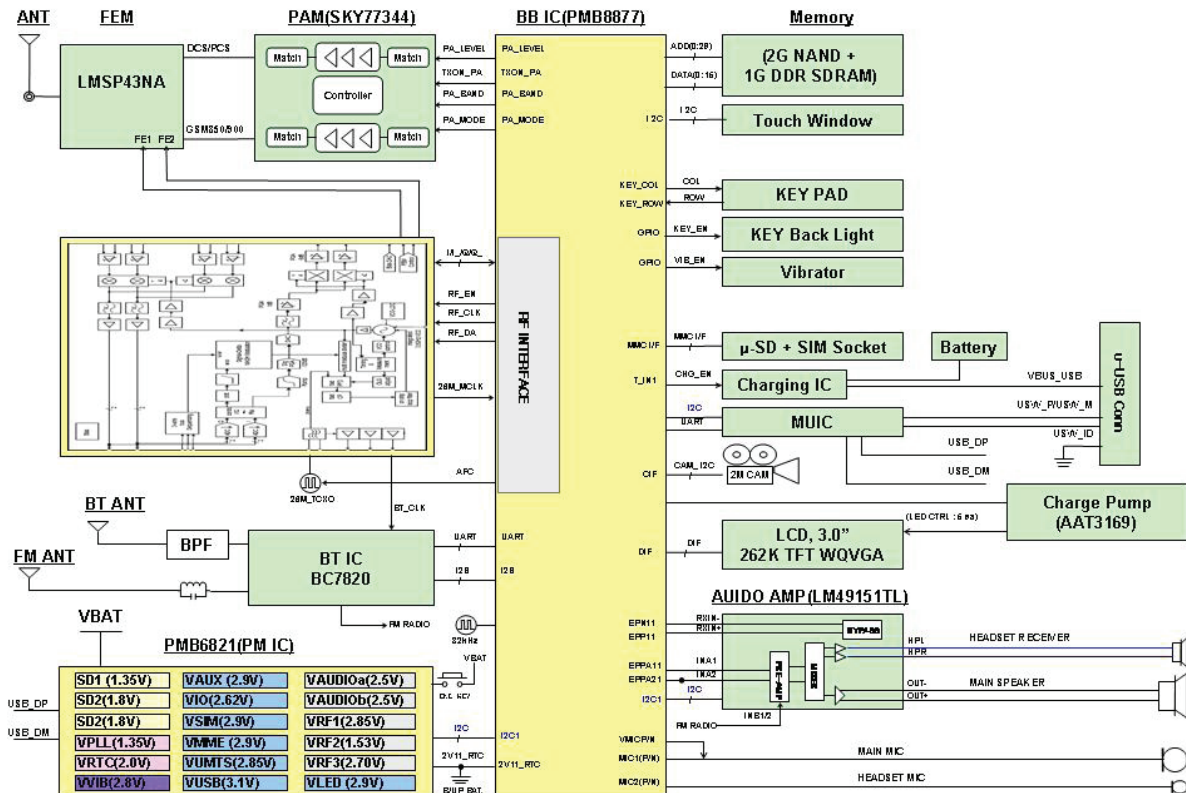
7. CIRCUIT DIAGRAM

BASE BAND PROCESSOR

Large Block Memory
(2048Mbit NAND / 1024 Mbit DDR SDRAM, 1.8V I/O)

U100
PMB8877

U101
K522H1HACB-B060

* Boot Mode

	TRIG_IN	
Large Block	P/U 1K	
Small Block	P/D 10K	

TRACE32(14 Pin)

PIN	NET	PIN	NET
1	2V8	2	GND
3	JTAGEN	4	GND
5	TDI	6	GND
7	TMS	8	GND
9	TCK	10	GND
11	TDO(DBR out)	12	_RESET
13	2V8	14	GND

TRACE32(20 Pin)

PIN	NET	PIN	NET
1	2V8	2	
3	JTAGEN	4	GND
5	TDI	6	GND
7	TMS	8	GND
9	TCK	10	GND
11		12	GND
13	TDO(DBR Out)	14	GND
15	_RESET	16	GND
17		18	GND
		20	GND

I2C1		I2C3	
I2C_SCL	I2C_SDA	I2C2_SCL	I2C2_SDA
PMIC		CAMERA	
AUDIO AMP			
TOUCH			
MUIC			

J-TAG

UART100

For product inspection TP

* Model check

	VALUE
GS290	DNI
GS390	100K

7. CIRCUIT DIAGRAM

PMIC

U202
PMB6821

Power On

External Reset JIG Connector

Micro USB

U200
MAX14526EEWP+TCC6

Single Charging IC for uUSB

7. CIRCUIT DIAGRAM

AUDIO AMP SUB SYSTEM & SIGNAL DISTRIBUTOR

MIC

3.5phi HEADSET

Receiver & Speaker

BATTERY CONNECTOR

Vibrator

BACKUP BATTERY

FM Radio(LNA)

FM Radio & Bluetooth_BC7_CSR

7. CIRCUIT DIAGRAM

2M FF CAM Connector

CAMERA PART POWER

SIM CONNECTOR

T-FLASH

Touch Connector   Touch IC

KEY LED

KEY PAD

VOL UP & DOWN

CLR

SEND

END

CAM   HOLD

LCD Connector

LCD Backlight

7. CIRCUIT DIAGRAM

RF

7. CIRCUIT DIAGRAM

F_KEY_CAM

CN100

KP_IN[3]
KP_OUT[0]

KB100

KP_OUT[0]

KP_IN[3]

7. CIRCUIT DIAGRAM

F_KEY_HOLD

CN100

1 → KP_IN[5]
2 → KP_OUT[0]
3

KB100

KP_OUT[0] →

KP_IN[5] →

7. CIRCUIT DIAGRAM

F_KEY_VOL

CN100

1 — KP_IN[3]
2 — KP_OUT[2]
3 — KP_OUT[3]
4

VOL-UP
KB100

KP_OUT[2]

VOL-DOWN
KB101

KP_OUT[3]

KP_IN[3]

8. BGA Pin Map

U100(PMB8877, EUSY0322801)

○: Use
◯: Not

8. BGA Pin Map

NC	NC	NC	-	-	-	-	-	-	NC	NC	NC
NC	NC	NC	-	-	-	-	-	-	NC	NC	NC
NC	NC	NC	VDDd	VSSd	/CKd	CKd	VDDd	VSSd	IO7n	NC	NC
NC	NC	NC	A0d	/CSd	/WEd	CKEd	A7d	A8d	IO6n	IO15n	-
-	NC	R/$\overline{\text{B}}$n	A1d	BA0d	/CASd	A12d	A6d	A13d	IO5n	IO14n	-
-	NC	/REn	A2d	BA1d	/RASd	A11d	A5d	NC	IO4n	IO13n	-
-	VSSn	/CEn	A3d	A10d	NC	A9d	A4d	NC	NC	IO12n	-
-	VCCn	NC	NC	NC	NC	NC	NC	NC	VSSn	NC	-
-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	-
-	NC	CLEn	NC	NC	LDMd	UDMd	NC	NC	NC	IO11n	-
-	NC	ALEn	DQ0d	DQ3d	LDQSd	UDQSd	DQ10d	DQ13d	IO3n	IO10n	-
-	NC	/WEn	DQ1d	DQ4d	DQ6d	DQ8d	DQ11d	DQ14d	IO2n	IO9n	-
-	NC	/WPn	DQ2d	DQ5d	DQ7d	DQ9d	DQ12d	DQ15d	IO1n	IO8n	-
NC	NC	NC	VDDQ	VSSQd	VDDd	VSSd	VDDQd	VSSd	IO0n	NC	NC
NC	NC	NC	-	-	-	-	-	-	NC	NC	NC
NC	NC	NC	-	-	-	-	-	-	NC	NC	NC

U101(K522H1HACB-B060, EUSY0388101)

NC : Not Use
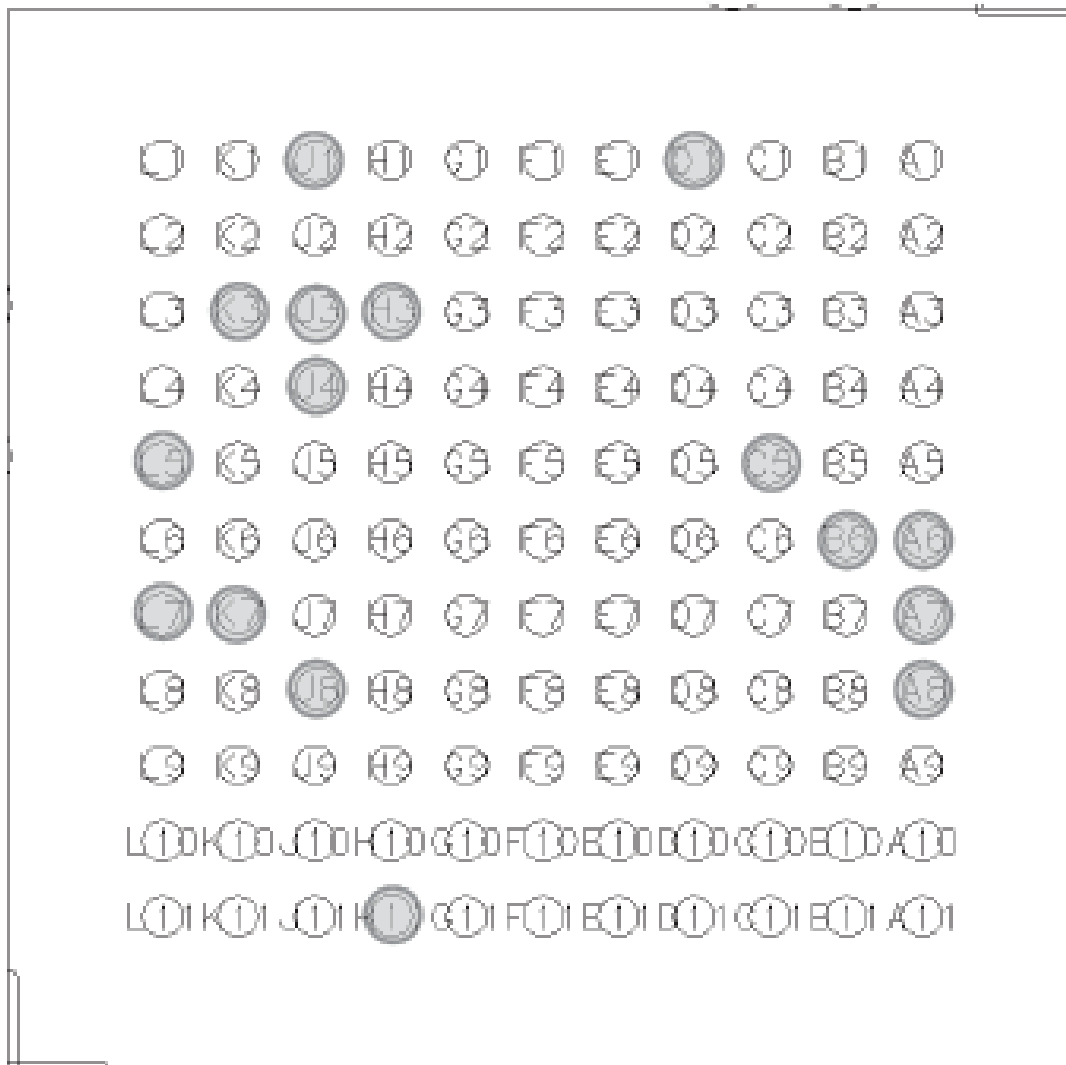
U202(PMB6821, EUSY0323901)

○ : Use
◯ : Not

8. BGA Pin Map
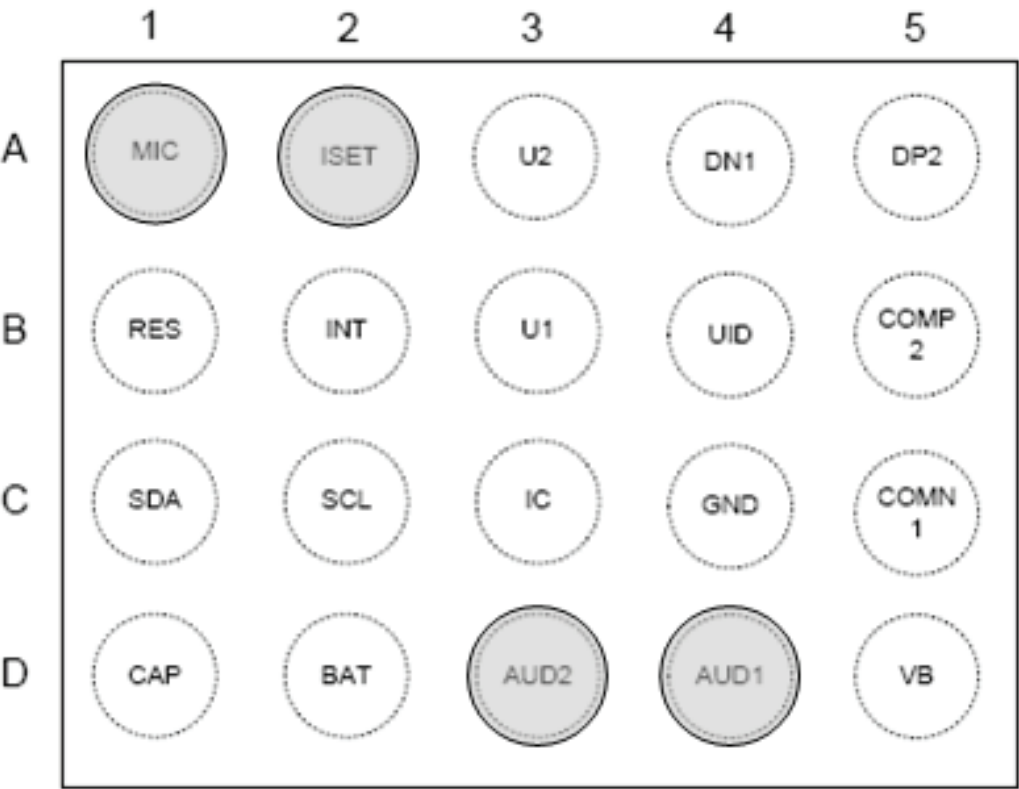
U200(MAX14526, EUSY0371201)

☐ : Use
▨ : Not Use

	A	B	C	D	E
4	LSOUT+	LSV$_{DD}$	CPV$_{SS}$	C1P	CPGND
3	LSOUT-	SCL	BYPASS	C1N	HPL
2	GND	SDA	INR	SET	HPR
1	I^{2}CV$_{DD}$	V$_{DD}$	INL	INM-	INM+
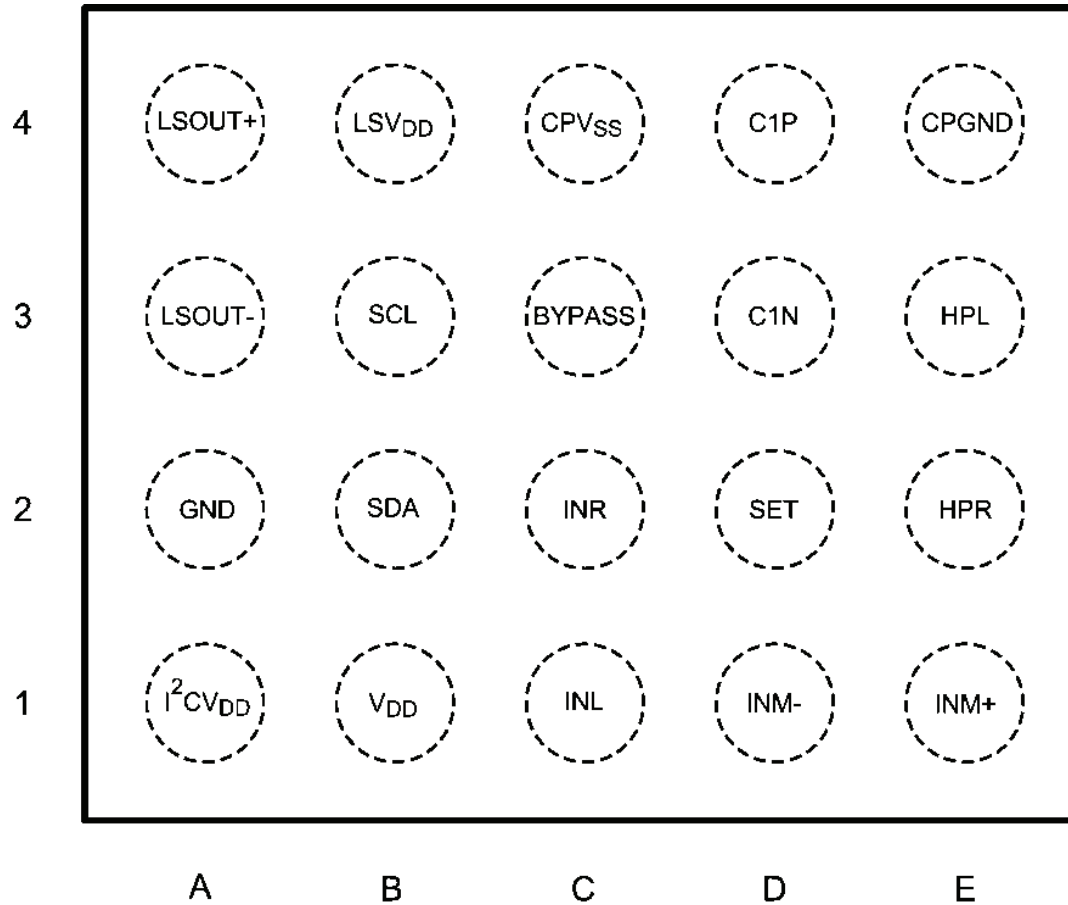
U304(LM49151TLX, EUSY0390501)

** USE ALL PINS
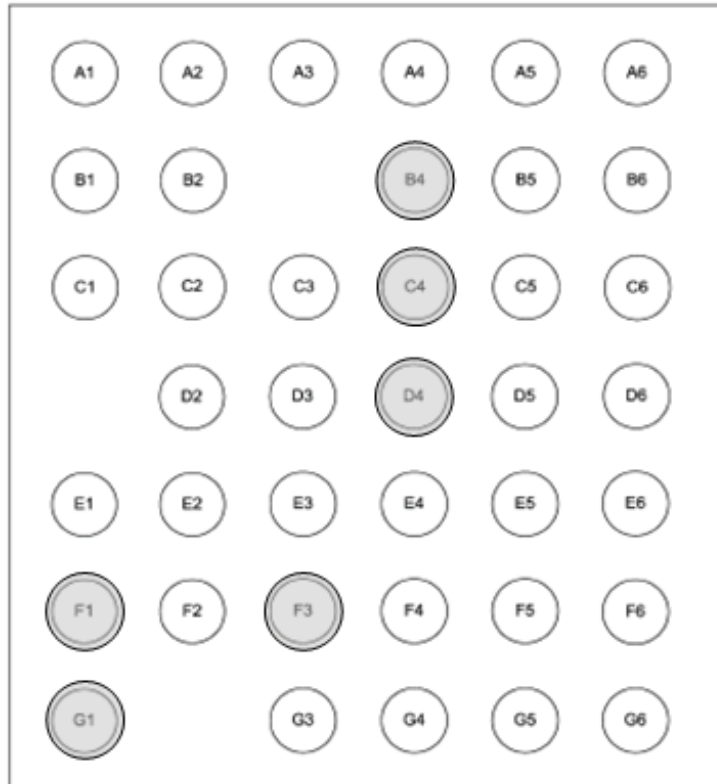
U301(BC7820, EUSY0394501)

☐ : Use
☐ : Not Use
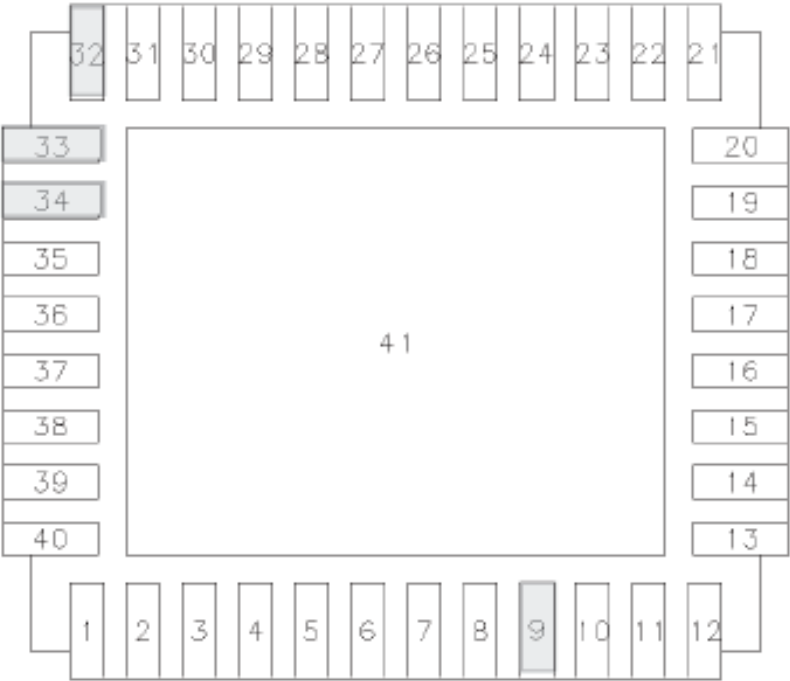
U500(PMB6821, EUSY0323901)

▭ : Use
▭ : Not Use

U501(SKY77344, SMPY0017601)

☐ : Use
☐ : Not Use

9. PCB LAYOUT

CN400 : Touch Conn.
 - no Touch sensing

CN400

MIC300 : Microphone
 - no far-end voice
 - no voice recording

KB402

MIC300

GS290_MAIN_1.0_PLACE_TOP

9. PCB LAYOUT

U303 : Vibrator Amp.
 - no Vibrator

U306 : Analog S/W
- no Sound

S400 : 2M Camera socket
- no Camera

U200 : MUIC
- no Booting
- no USB/Serial Connection

CN200 : I/O conn.
- no USB Connection.
- no Serial Connection.

U304 : Audio Amp.
- no Sound

U201 : Charging IC
- no Battery Charge

J400 : SIM Conn.
- No SIM

CN300 : Battery Conn.
- no power On

U501 : PAM
- no Service
- RF Sensitivity & TX Power

FL500 : FEM
- no Service
- RF Sensitivity & TX Power

U500 : Transceiver
- no Service
- RF Sensitivity & TX Power

J300 : 3.5pi Ear-Jack
- no Sound

ANT303 : FM Ant. Conn.
- no Radio with Intenna

U202 : PMIC
- no Booting
- no Power On
- no Service

U101 : Memory
- no Booting

M300 : BackupCap.
 - RTC Reset

CN402 : LCD Conn.
- no Display

U401 : ChargePump
 - no LCD backlight

U301 : BT+FM Radio Module
- no BT Connection
- no FM Radio

U100 : DBB
- no Power On
- no Servive

S401 : T-Flash Socket
 - no T-Flash Memory

X500 : 26Mhz X-tal
- no Power On
- no Service

GS290_MAIN_1.0_PLACE_BOT

9. PCB LAYOUT

CN100

KB100
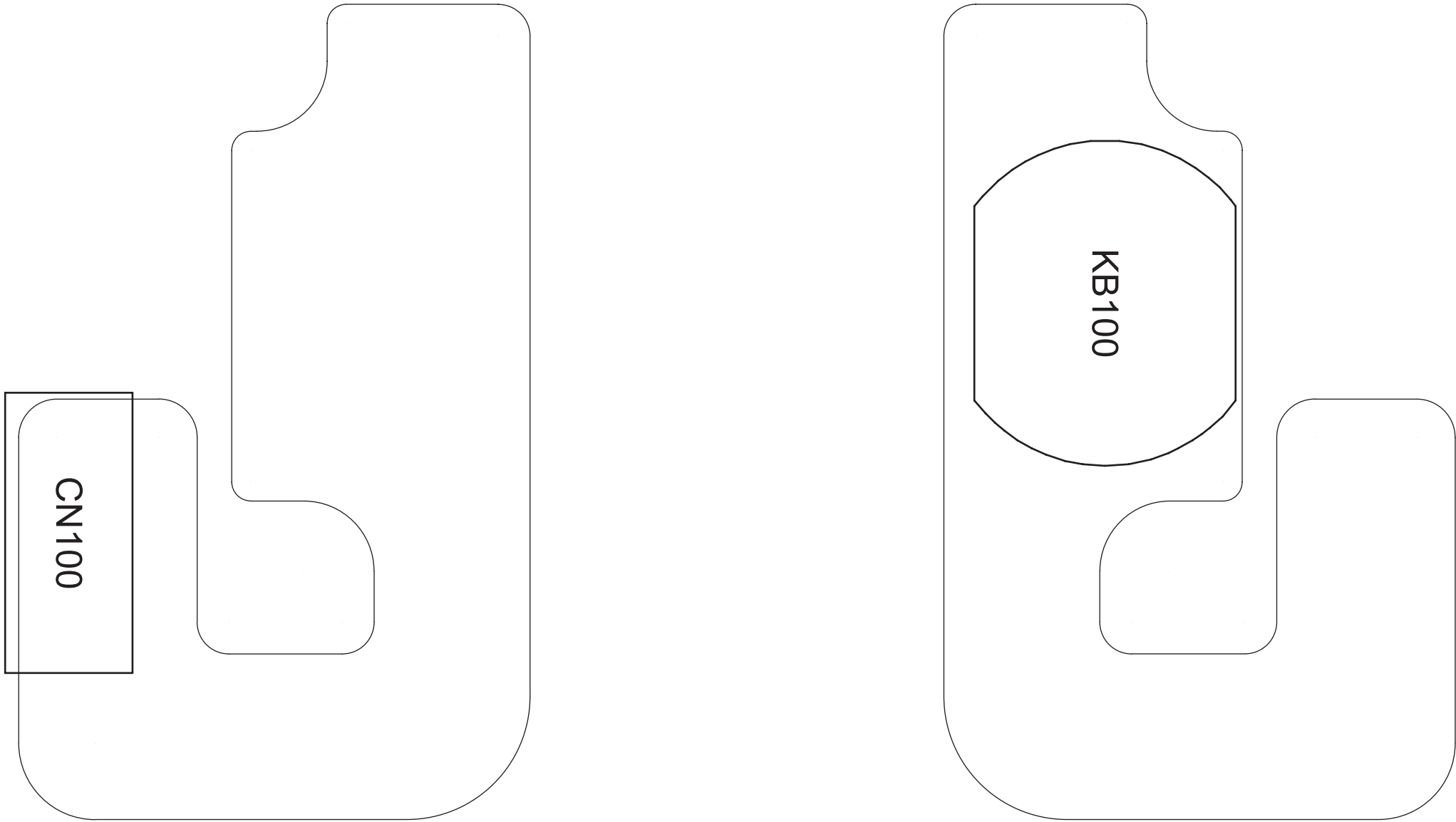
GS290_F_SK_CAM_SPKY0081401-1.1

9. PCB LAYOUT

CN100

KB100
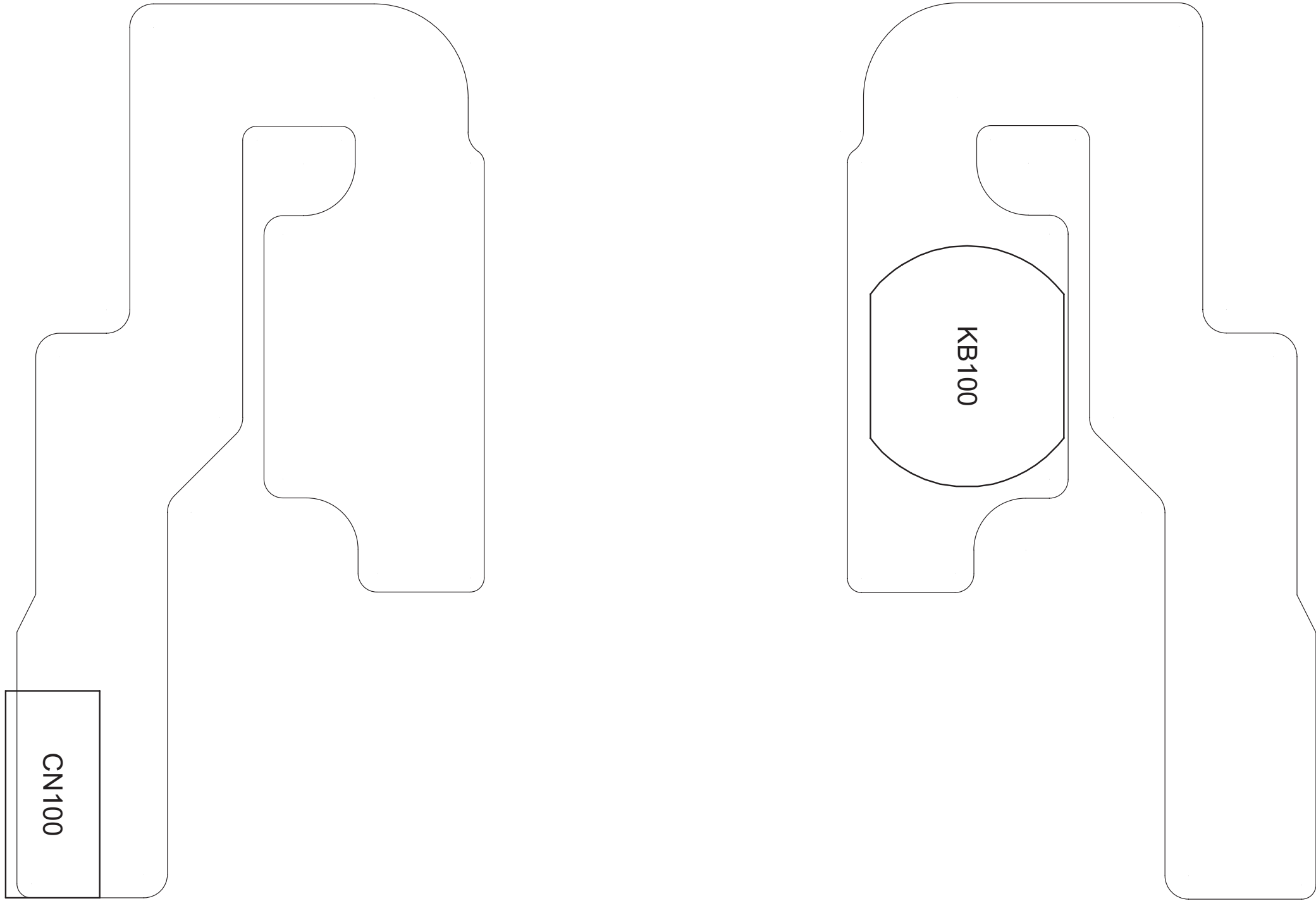
GS290_F_SK_HOLD_SPKY0081101-1.1

9. PCB LAYOUT

KB100

CN100

KB101
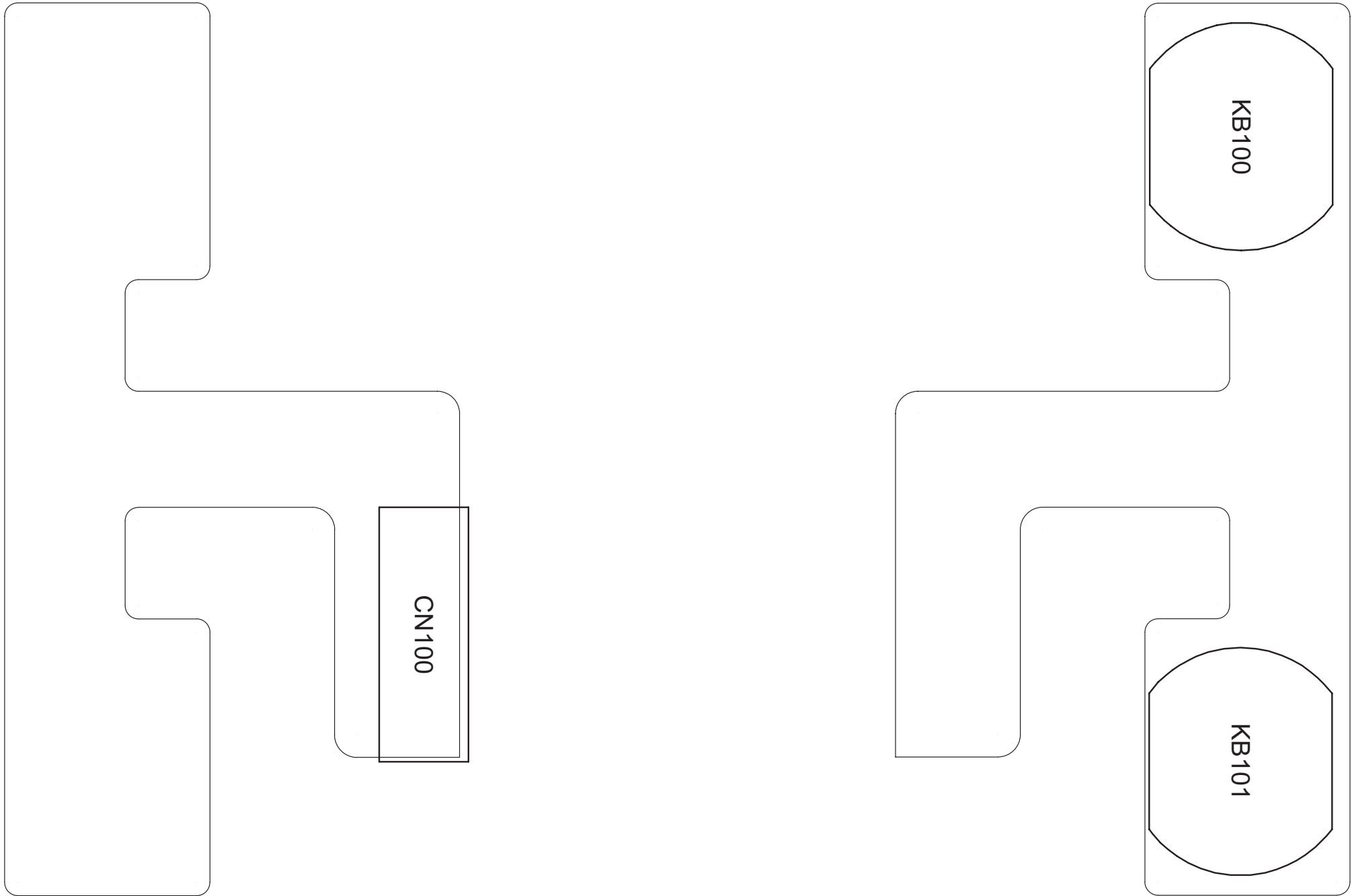
GS290_F_SK_VOL_SPKY0077101-1.0

10.ENGINEERING MODE

10.1. Test Equipment Setup
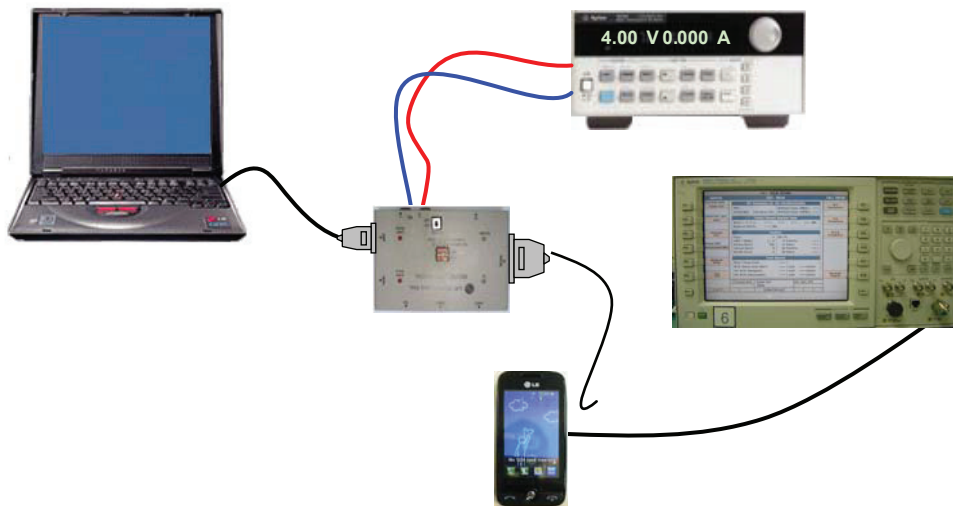
10.2. Calibration Step

2.1. Turn on the Phone.
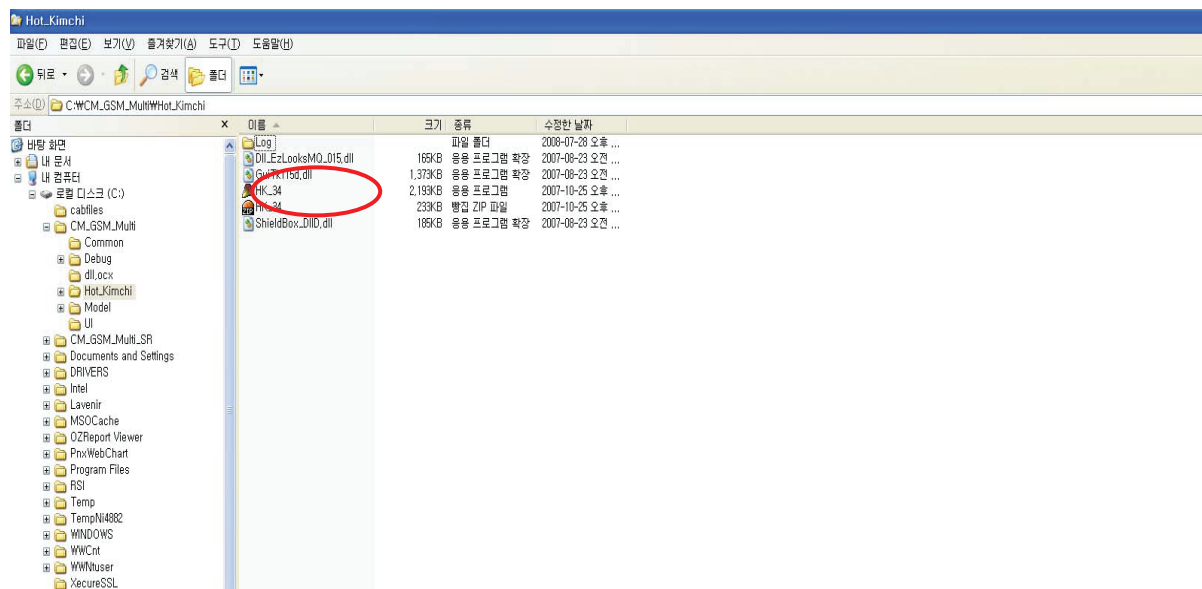
10.ENGINEERING MODE

2.3. Click "SETTING" Menu
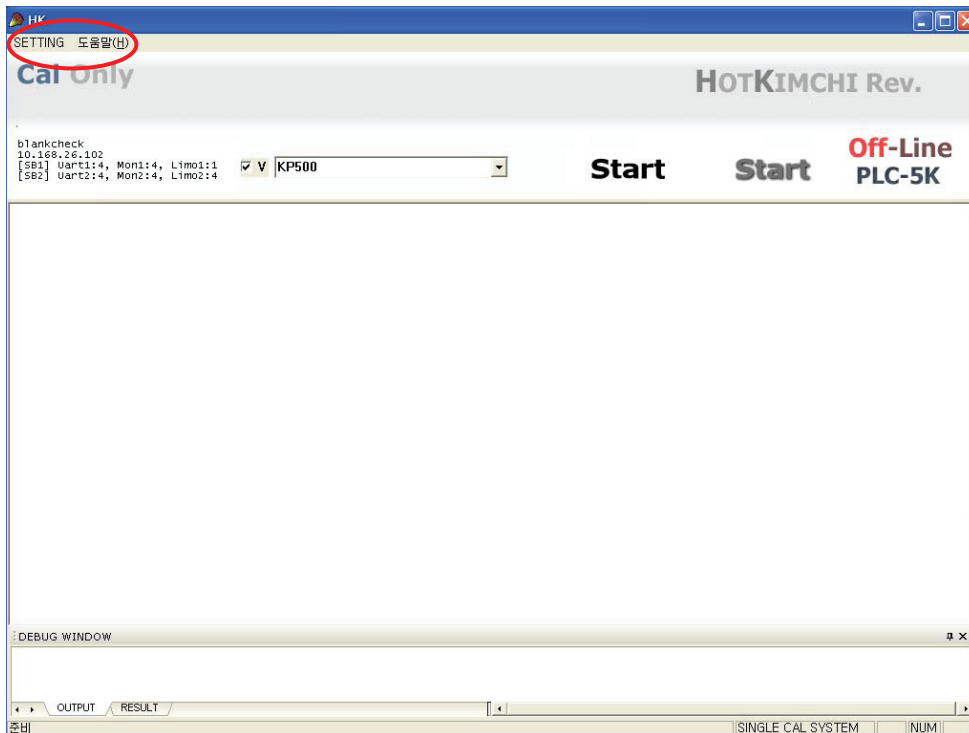
2.4. Setup "Ezlooks" menu such as the following figure
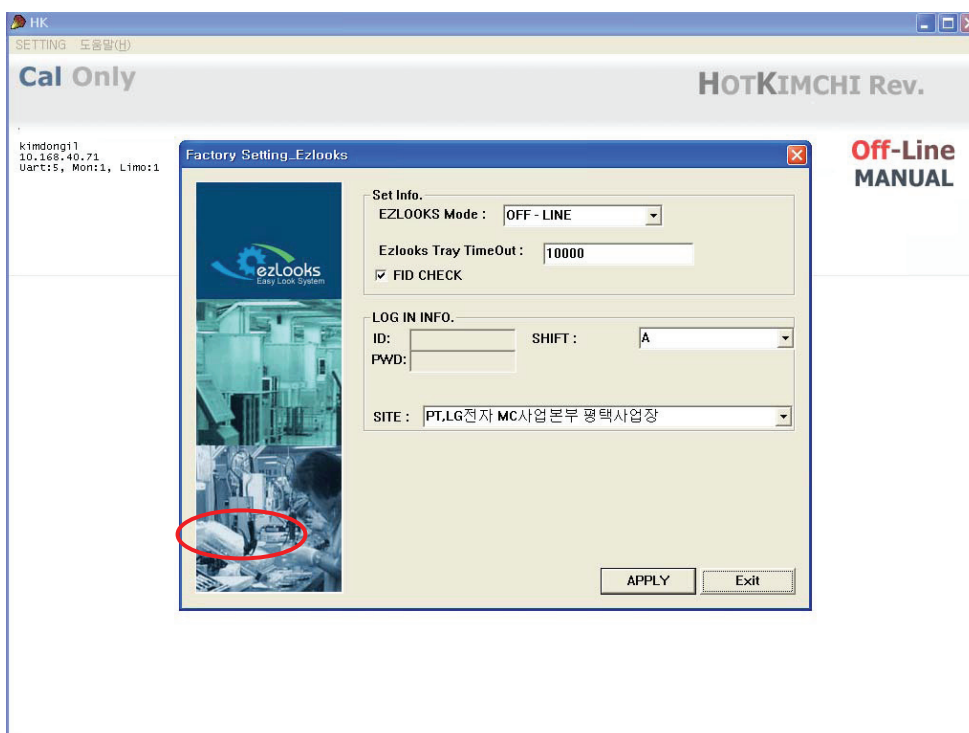
2.5. Setup "Line System" menu such as the following figure

Adjust number of times
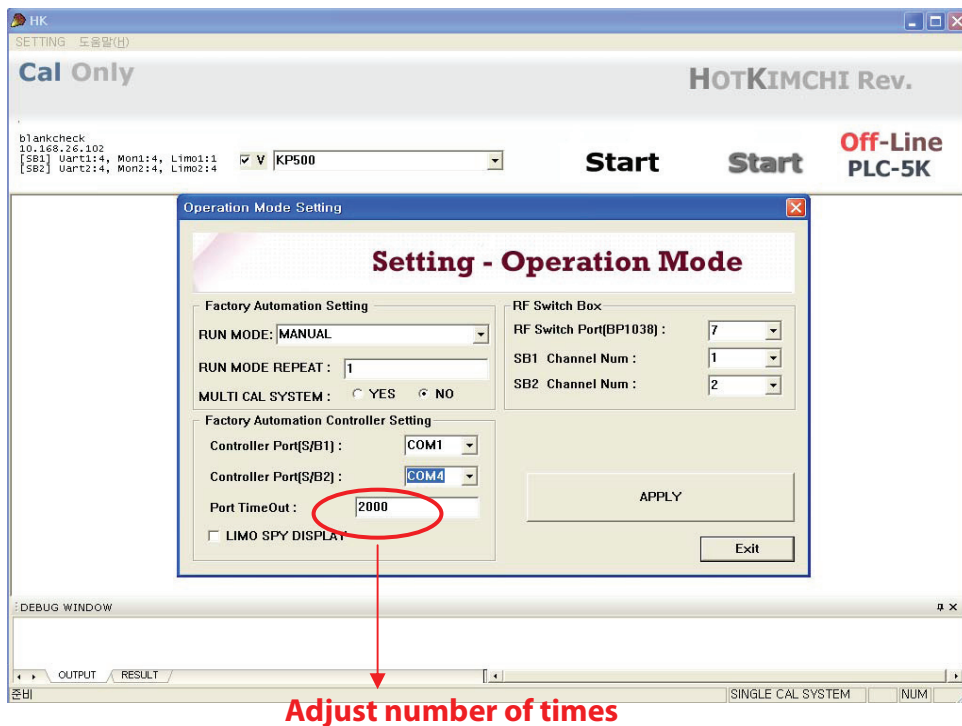
2.6.Setup Logic operation such as the following figure.

Setup UART port

PWR: Power supply
CELL: Call Test Equipment

Operation Mode
1. By-Pass: not control by GPIB
2. Normal: control by GPIB
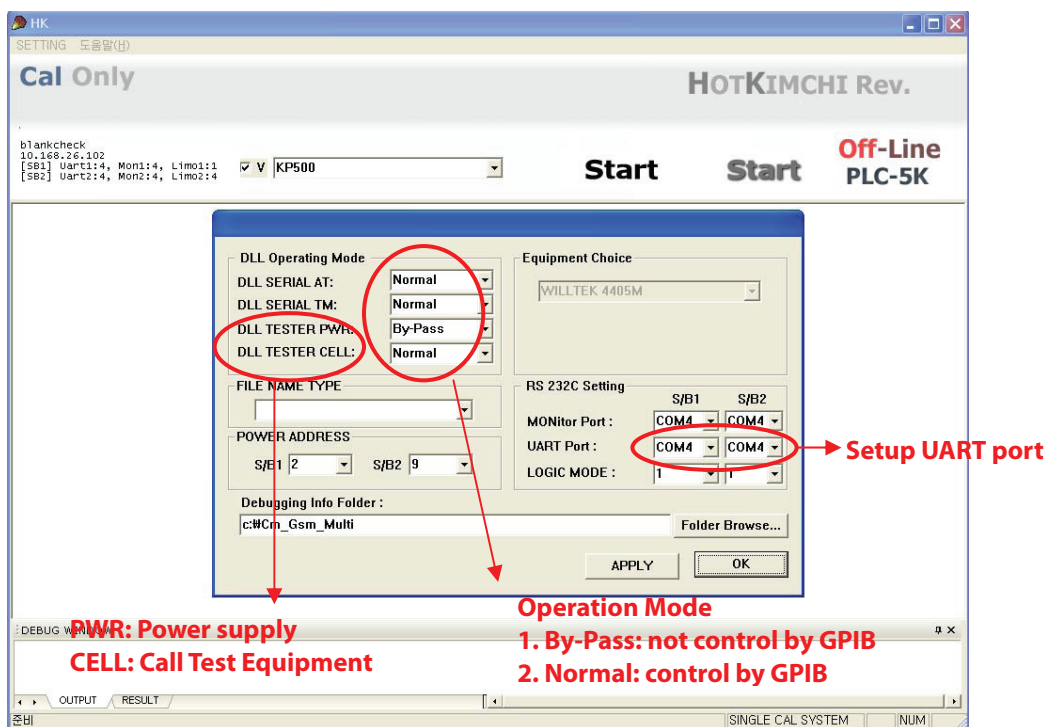
10.ENGINEERING MODE

2.7. Select "MODEL".

2.8. Click "START" for RF calibration
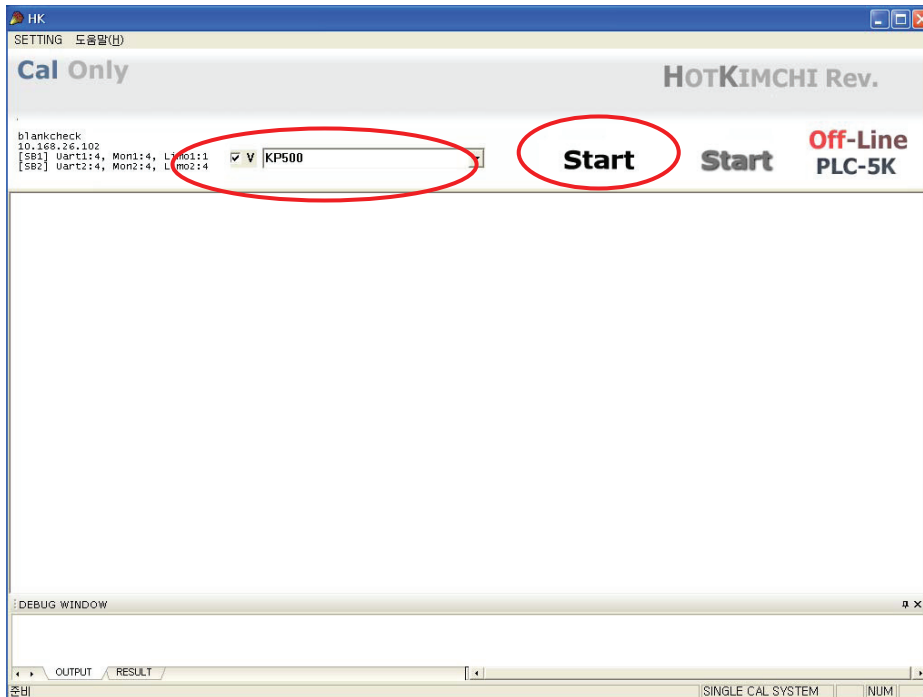
2.9. RF Calibration finishes.
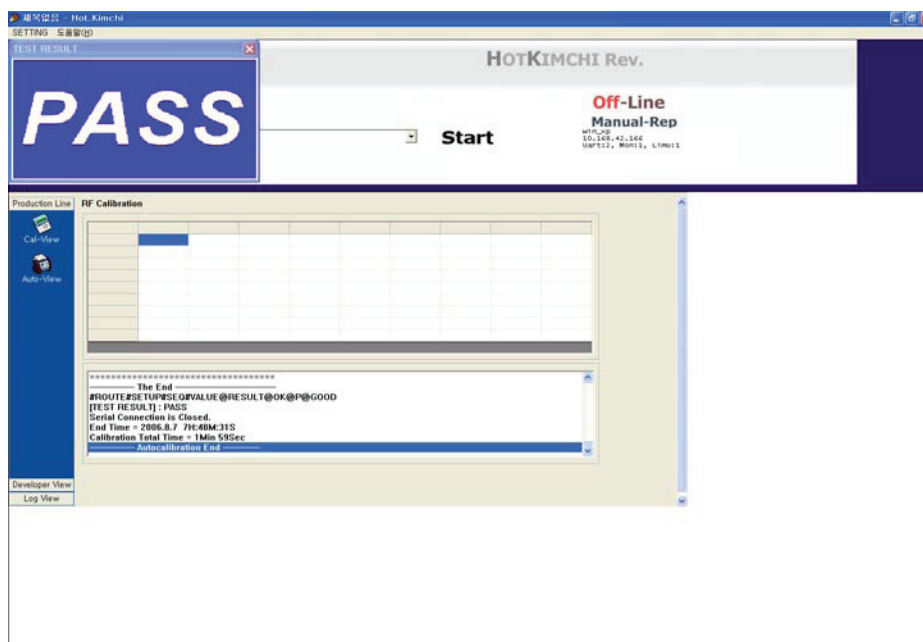
2.10. Calibration data will be saved to the following folder.
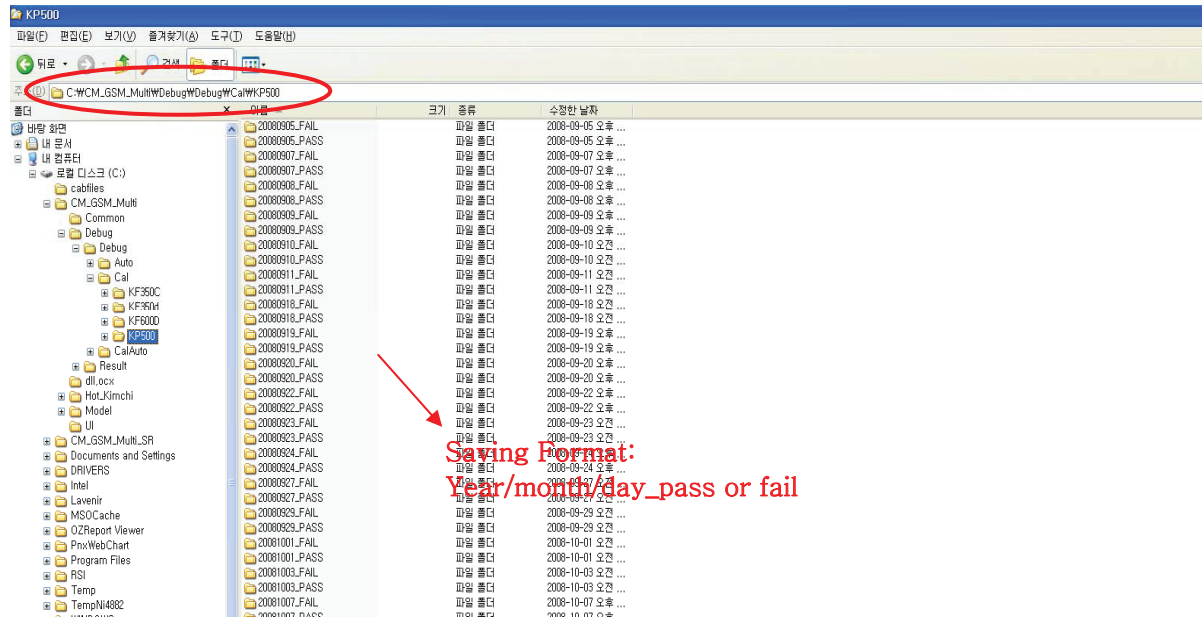
Notices:

1. The state of Phone is " test mode " during the CALIBRATION.

2. Calibration program automatically changes either "normal mode" or "ptest mode".

3. RF Calibration steps as follow:

TX Channel compensation: EGSM->GSM850->DCS->PCS->EDGE EGSM->EDGE GSM850->EDGE DCS->EDGE PCS

RX Channel compensation: EGSM->GSM850->DCS->PCS

4. Phone Operation Mode
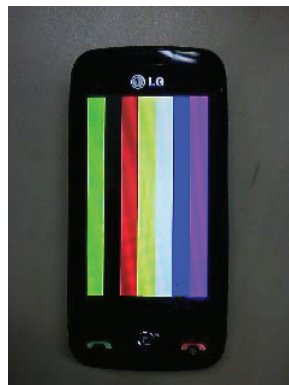
< Normal Mode >   **< Ptest Mode>**

11. STAND ALONE TEST

11.1. Test Program Setting

① Set COM Port.

② Check PC Baud rate.

③ Confirm EEPROM & Delta file prefix name.
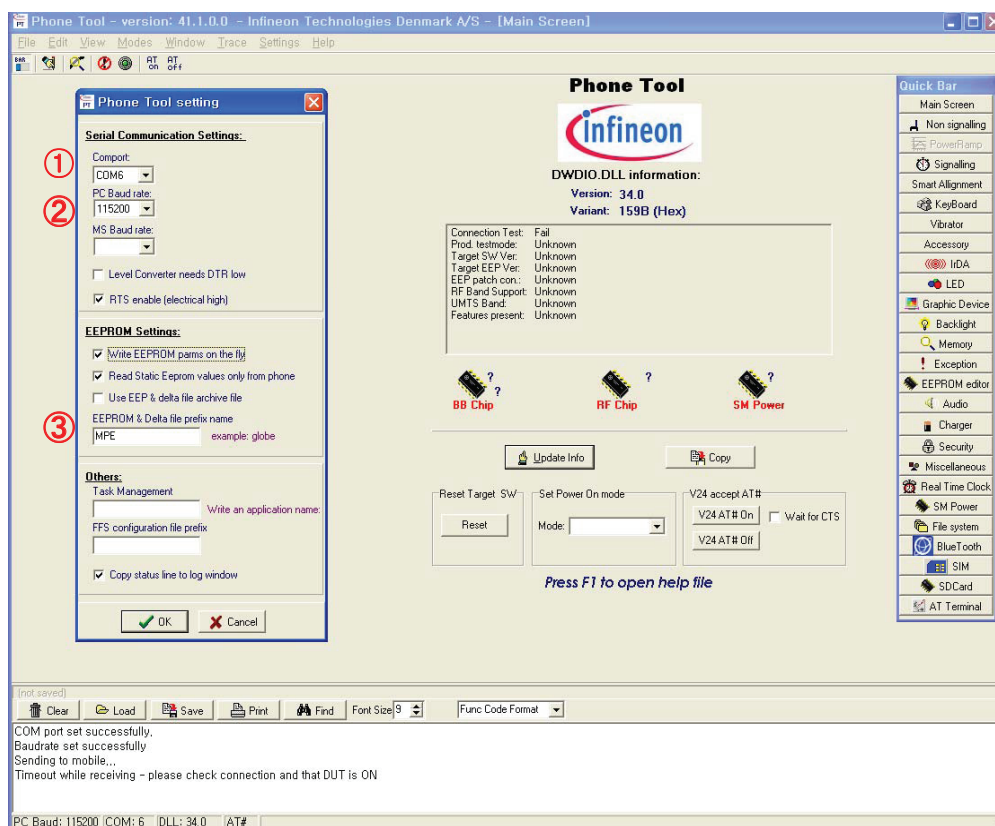
④ Click "Update Info" for communicating Phone and Test-Program.
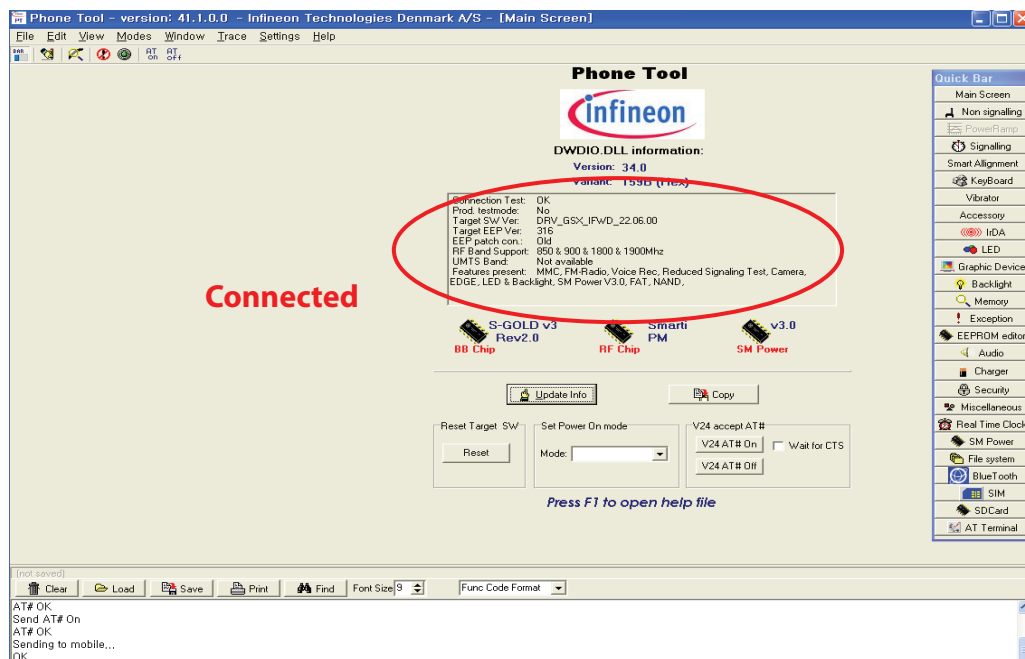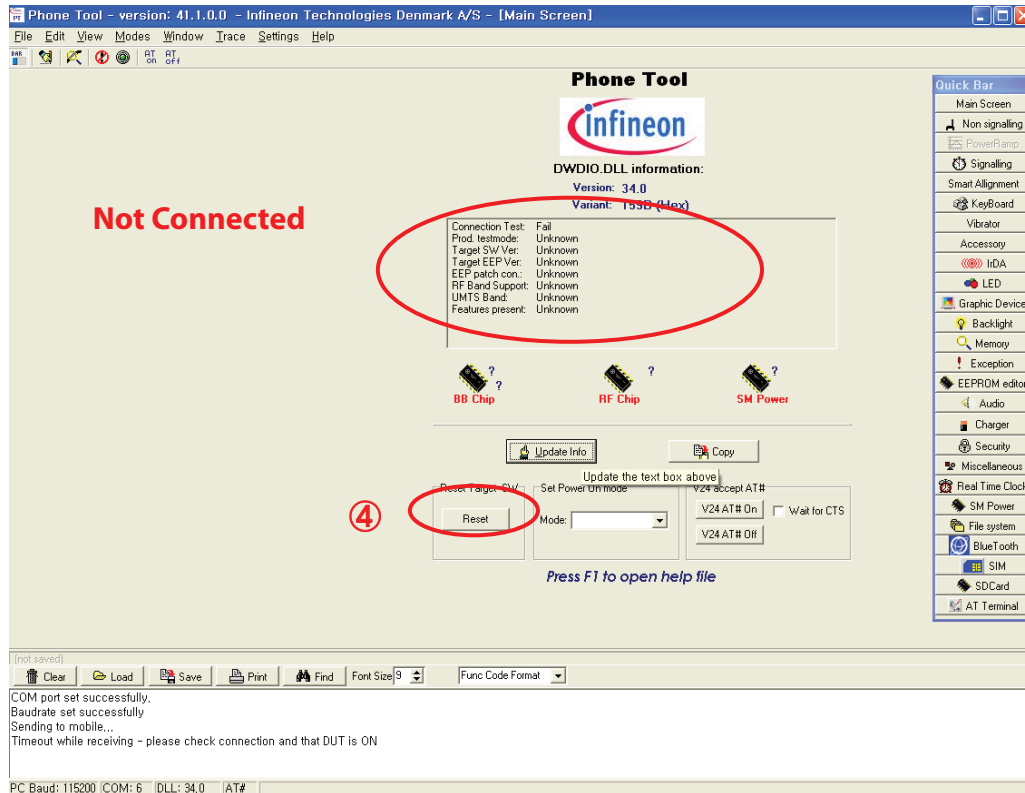
⑤ For the purpose of the Standalone Test, Change the Phone to "ptest mode" and then Click the "Reset" bar.

⑥ Select "Non signaling" in the Quick Bar menu. Then Standalone Test setup is finished.
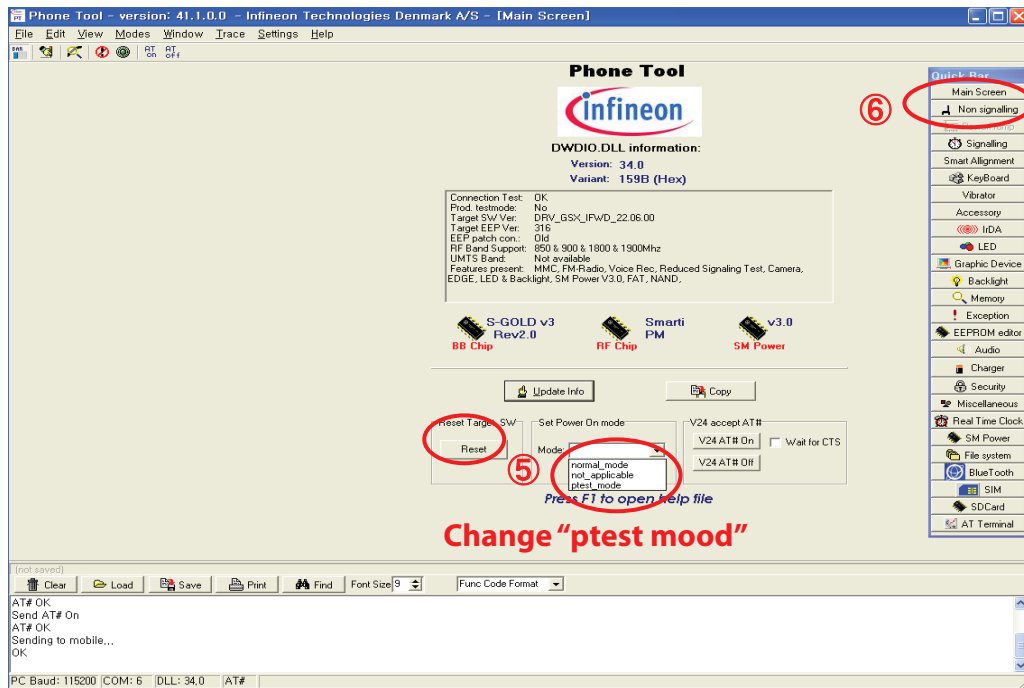
11.2.Tx Test

① Click "Non signaling mode" bar and then confirm "OK" text in the command line.
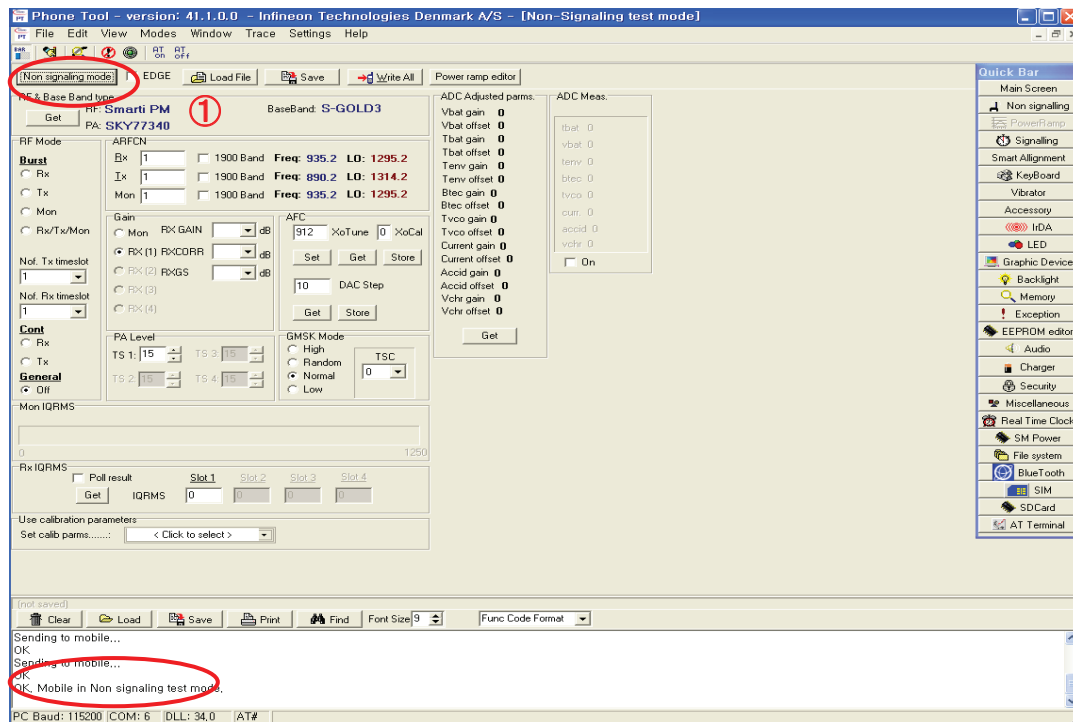
② Put the number of TX Channel in the ARFCN.

③ Select "Tx" in the RF mode menu and "PCL" in the PA Level menu.

④ Finally, Click "Write All" bar and try the efficiency test of Phone.
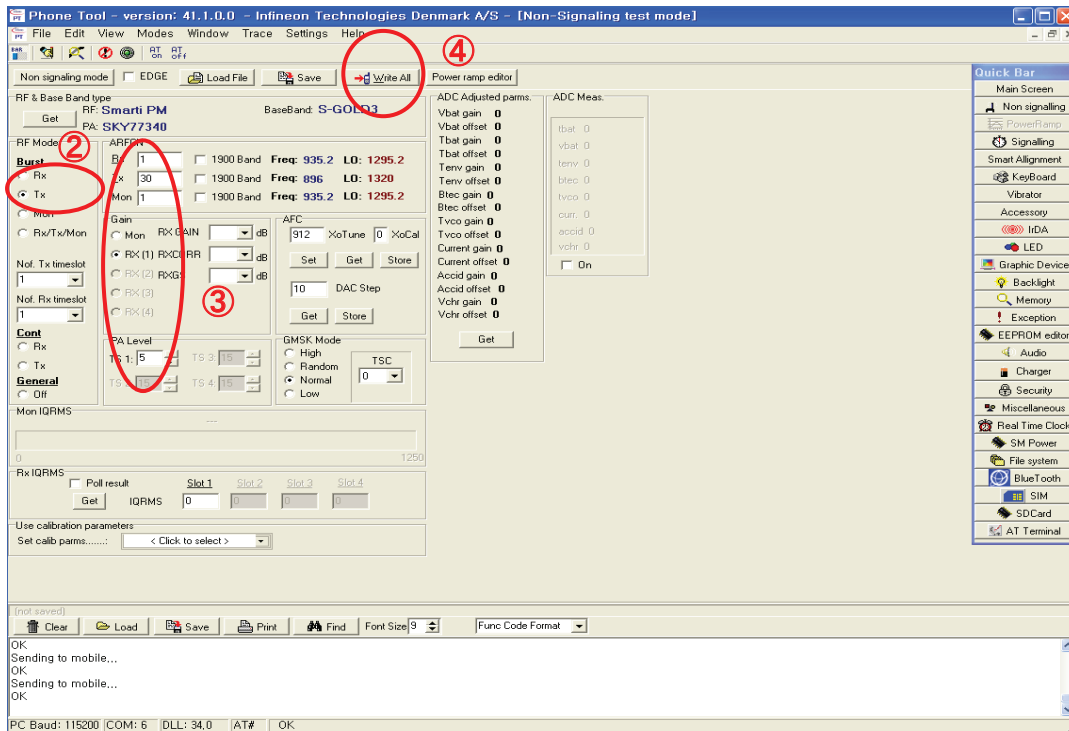
11.3. Rx Test

① Put the number of RX Channel in the ARFCN.

② Select "Rx" in the RF mode menu.

③ Finally, Click "Write All" bar and try the efficiency test of Phone.
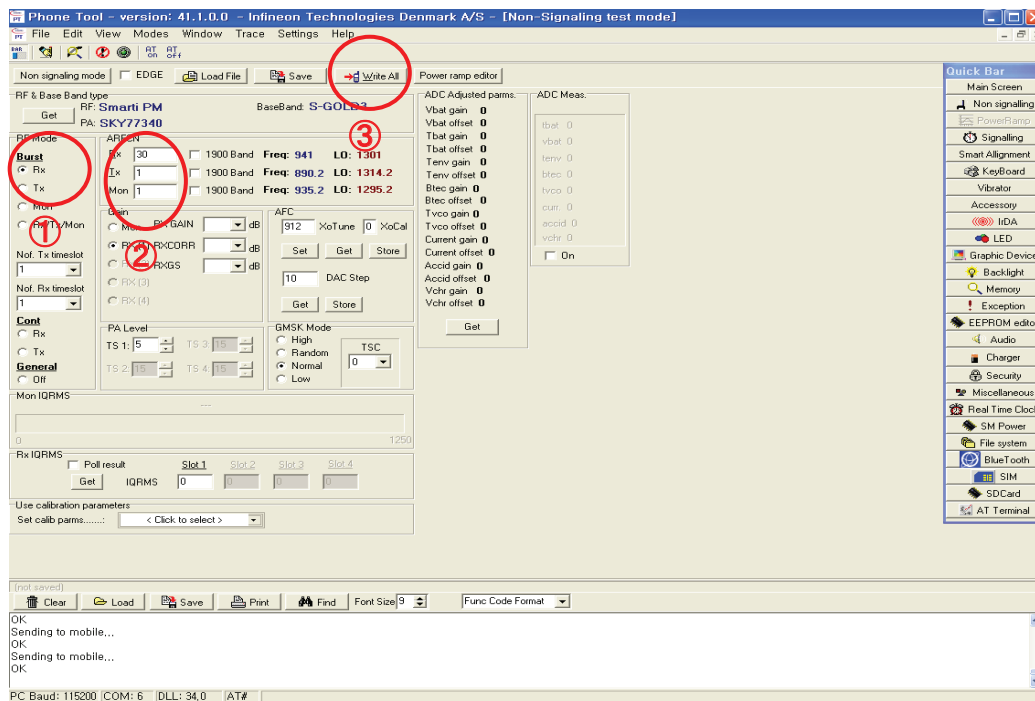
④ The Phone must be changed "normal mode" after finishing Test.

⑤ Change the Phone to "normal mode" and then Click the "Reset" bar.\
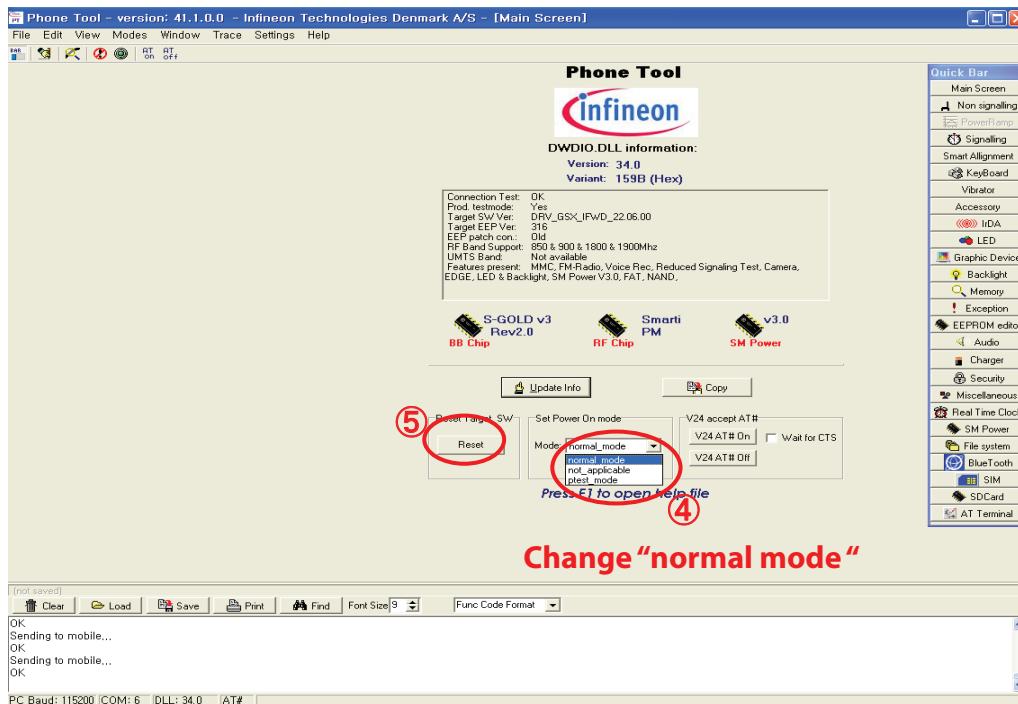
12. EXPLODED VIEW & REPLACEMENT PART LIST

12.1 EXPLODED VIEW
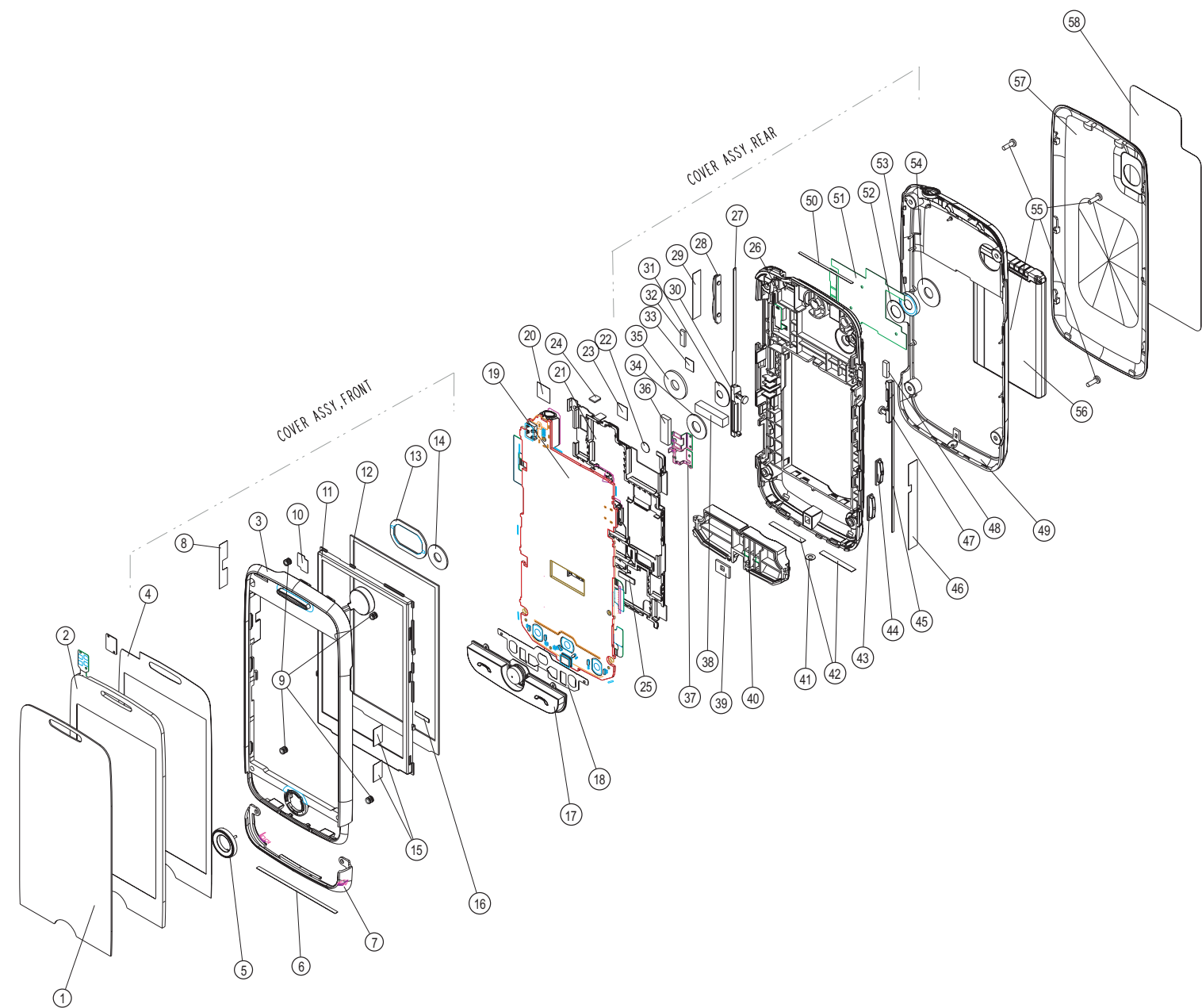
No	Part Name	Part Number	Q'ty	Remark
58	TAPE,PROTECTION(B,C)	MTAB040730I	I	
57	COVER,BATTERY	MCJA010250I	I	
56	BATTERY	SBPL009890I	I	
55	SCREW,MACHINE(FRAME)	GMEY0007902	4	
54	TAPE,PROTECTION(CAMERA)	MTAB036000I	I	
53	WINDOW,CAMERA	MWAE005540I	I	
52	TAPE,WINDOW,CAMERA	MTAZ026680I	I	
51	ANTENA,FM	SNGF005600I	I	
50	TAPE,DECO,REAR-4	MTAZ026900I	I	
49	DECO,COVER,REAR	MDAY004990I	I	
48	PAD,REAR	MPBZ027090I	I	
47	CAP,USB	MCCZ003490I	I	
46	TAPE,PROTECTION(hole & camera)	MTAB035980I	I	
45	TAPE.DECO,REAR-3	MTAZ026890I	I	
44	BUTTON,SIDE(Hold)	MBJZ001700I	I	
43	BUTTON,SIDE(Camera)	MBJZ001690I	I	
42	TAPE,DECO,REAR-1	MTAZ026870I	2	
41	TAPE,MIC	MTAZ026910I	I	
40	INTENNA,ASSY	SNGF005620I	I	
39	PAD,MIC	MPBZ025380I	I	
38	PAD,REAR-2	MPBZ028360I	I	
37	ANTENA,BT	SNGF005610I	I	
36	PAD,CONN(LCD)	MPBU008870I	I	
35	PAD,SPEAKER(2)	MPBN008160I	I	
34	PAD,CAMERA	MPBT008710I	I	
33	PC SHEET,REAR	MASZ006810I	I	
32	PAD,REAR-4	MPBZ028370I	I	
31	PAD,VIBRATOR(2)	MPBJ007130I	I	
30	CAP,MICRO SD	MCCG002370I	I	
29	TAPE,PROTECTION(Volume)	MTAB035970I	I	
28	BUTTON,SIDE(Volume)	MBJZ001710I	I	
27	TAPE,DECO,REAR-2	MTAZ026880I	I	
26	COVER,REAR	MCJN011320I	I	
25	GASKET,CAN SHIELD	MGAZ009310I	I	
24	PAD,CAN	MPBZ028270I	I	
23	INSULATOR,SHIELDCAN	MIDZ024100I	I	
22	LABEL,AS	MLAB000110I2	I	
21	CAN,SHIELD	MCBA006610I	I	
20	INSULATOR,PCB	MIDZ025250I	I	
19	PCB ASSY,MAIN	SAFY033250I	I	
18	DOME ASSY,METAL	ADCA010640I	I	
17	BUTTON ASSY,MAIN	AKAC000560I	I	
16	GASKET,ESD	MGAZ008570I	I	
15	TAPE,CAMERA_HOLD	MTAZ032140I	2	
14	PAD,VIBRATOR	MPBJ007120I	I	
13	PAD,SPEAKER	MPBN007610I	I	
12	PAD,LCD	MPBG010290I	I	
11	BRAKET,LCD	MBFZ004150I	I	
10	TAPE,FPCB(Window)	MTAZ026940I	I	
9	INSERT,NUT	MICC001000I	4	
8	TAPE,VOLUME	MTAZ032130I	I	
7	DECO,FRONT	MDAY004970I	I	
6	TAPE,DECO,FRONT(2)	MTAZ026850I	I	
5	DECO,BUTTON	MDAY004980I	I	
4	TAPE,WINDOW	MTAD011800I	I	
3	COVER,FRONT	MCJK011860I	I	
2	WINDOW,LCD	MWAC013270I	I	
1	TAPE,PROTECTION(WINDOW)	MTAB035990I	I	

ASS'Y EXPLODED VIEW
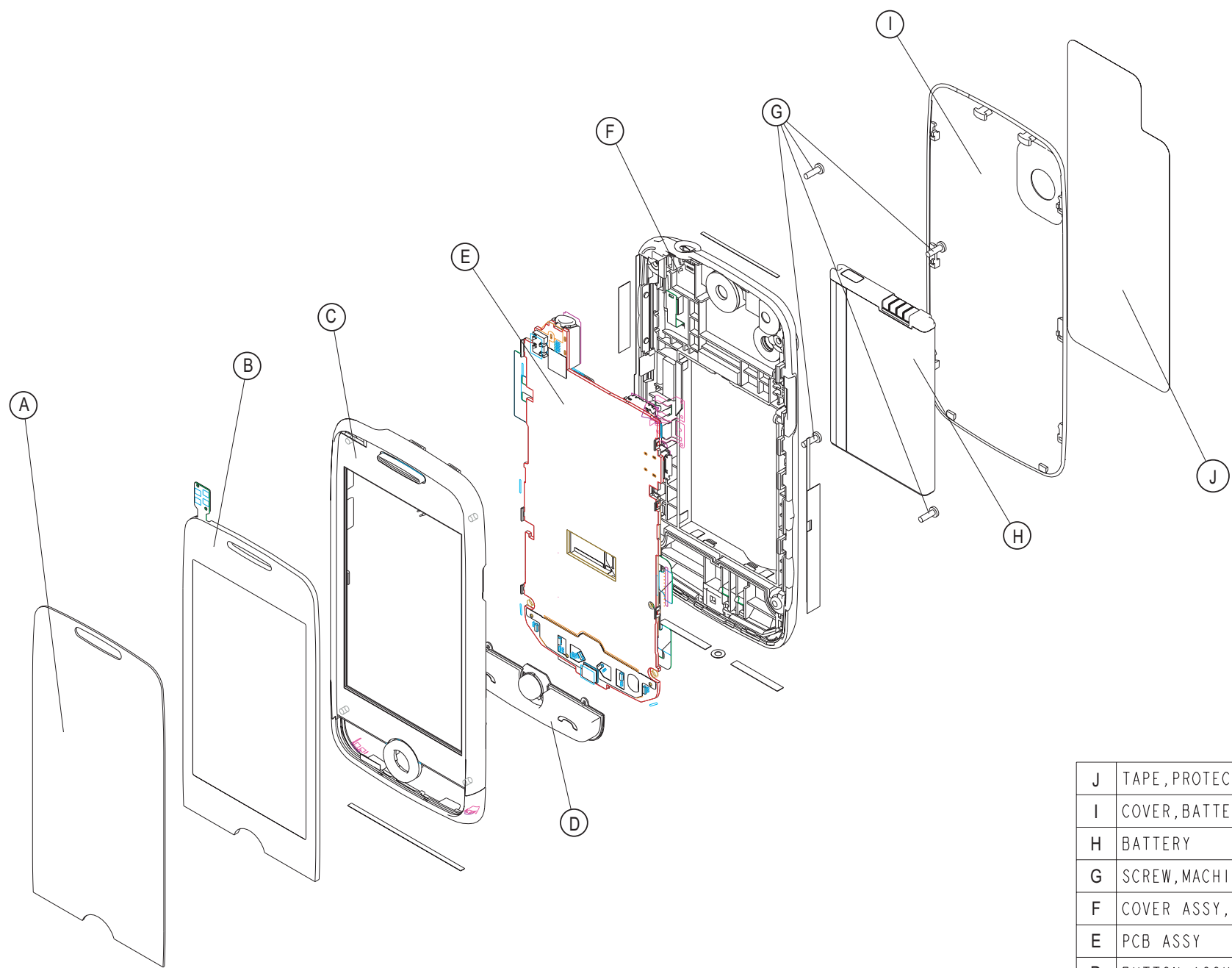
No	Part Name	Part Number	Q'ty	Remark
J	TAPE,PROTECTION(B,C)	MTAB040730I	I	
I	COVER,BATTERY	MCJA0I0250I	I	
H	BATTERY	SBPL009890I	I	
G	SCREW,MACHINE(FRAME)	GMEY0007902	4	
F	COVER ASSY, REAR	ACGM0I4760I	I	
E	PCB ASSY	SAFY033250I	I	
D	BUTTON ASSY,MAIN	AKAC000560I	I	
C	COVER ASSY, FRONT	ACGK0I4950I	I	
B	WINDOW,LCD	MWAC0I3270I	I	
A	TAPE,PROTECTION(WINDOW)	MTAB035990I	I	

12.2 Replacement Parts
<Mechanic component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Color	Remark
2	APEY00	PHONE	APEY0880601		BLACK	
3	ACGM00	COVER ASSY,REAR	ACGM0147601		BLACK	F
4	MBJZ00	BUTTON	MBJZ0017101	MOLD, PC LUPOY SC-1004A, , , , ,	BLACK	28
4	MBJZ01	BUTTON	MBJZ0016901	MOLD, PC LUPOY SC-1004A, , , , ,	BLACK	43
4	MBJZ02	BUTTON	MBJZ0017001	MOLD, PC LUPOY SC-1004A, , , , ,	BLACK	44
4	MCCG00	CAP,MULTIMEDIA CARD	MCCG0023701	MOLD, PC LUPOY SC-1004A, , , , ,	BLACK	30
4	MCCZ00	CAP	MCCZ0034901	MOLD, PC LUPOY SC-1004A, , , , ,	BLACK	47
4	MCJN00	COVER,REAR	MCJN0113201	MOLD, PC LUPOY SC-1004A, , , , ,	SILVER	26
4	MDAY00	DECO	MDAY0049901	MOLD, PC LUPOY SC-1004A, , , , ,	BLACK	49
4	MPBJ00	PAD,MOTOR	MPBJ0071301	COMPLEX, (empty), , , , ,	WITHOUT COLOR	31
4	MPBN00	PAD,SPEAKER	MPBN0081601	COMPLEX, (empty), , , , ,	WITHOUT COLOR	35
4	MPBT00	PAD,CAMERA	MPBT0087101	COMPLEX, (empty), , , , ,	WITHOUT COLOR	34
4	MPBU00	PAD,CONNECTOR	MPBU0088701	COMPLEX, (empty), , , , ,	WITHOUT COLOR	36
4	MPBZ00	PAD	MPBZ0253801	COMPLEX, (empty), , , , ,	WITHOUT COLOR	39
4	MPBZ01	PAD	MPBZ0270901	COMPLEX, (empty), , , , ,	WITHOUT COLOR	48
4	MPBZ02	PAD	MPBZ0283601	COMPLEX, (empty), , , , ,	WITHOUT COLOR	38
4	MPBZ03	PAD	MPBZ0283701	COMPLEX, (empty), , , , ,	WITHOUT COLOR	32
4	MSAZ00	SHEET	MSAZ0068101	COMPLEX, (empty), , , , ,	WITHOUT COLOR	33
4	MTAB00	TAPE,PROTECTION	MTAB0360001	COMPLEX, (empty), , , , ,	WITHOUT COLOR	54
4	MTAB01	TAPE,PROTECTION	MTAB0359701	COMPLEX, (empty), , , , ,	WITHOUT COLOR	29
4	MTAB02	TAPE,PROTECTION	MTAB0359801	COMPLEX, (empty), , , , ,	WITHOUT COLOR	46
4	MTAZ00	TAPE	MTAZ0268701	COMPLEX, (empty), , , , ,	WITHOUT COLOR	42
4	MTAZ01	TAPE	MTAZ0266801	COMPLEX, (empty), , , , ,	WITHOUT COLOR	52

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Level	Location No.	Description	Part Number	Spec	Color	Remark
4	MTAZ02	TAPE	MTAZ0268801	COMPLEX, (empty), , , , ,	WITHOUT COLOR	27
4	MTAZ03	TAPE	MTAZ0268901	COMPLEX, (empty), , , , ,	WITHOUT COLOR	45
4	MTAZ04	TAPE	MTAZ0269001	COMPLEX, (empty), , , , ,	WITHOUT COLOR	50
4	MTAZ06	TAPE	MTAZ0269101	COMPLEX, (empty), , , , ,	WITHOUT COLOR	41
4	MWAE00	WINDOW,CAMERA	MWAE0055401	CUTTING, PMMA MR 200, , , , ,	WITHOUT COLOR	53
3	ACGV00	COVER ASSY,BAR	ACGV0013201		BLACK	
4	ACGK00	COVER ASSY,FRONT	ACGK0149501		BLACK	C
5	MBFZ00	BRACKET	MBFZ0041501	PRESS, STS, 0.4, , , ,	WITHOUT COLOR	11
5	MCJK00	COVER,FRONT	MCJK0118601	MOLD, PC LUPOY SC-1004A, , , , ,	BLACK	3
5	MDAY00	DECO	MDAY0049801	MOLD, PC LUPOY SC-1004A, , , , ,	BLACK	5
5	MDAY01	DECO	MDAY0049701	MOLD, PC LUPOY SC-1004A, , , , ,	BLACK	7
5	MGAZ00	GASKET	MGAZ0085701	COMPLEX, (empty), , , , ,	WITHOUT COLOR	16
5	MICC00	INSERT,FRONT(UPPER)	MICC0010001	D2.2 L2.0 KURL 45	GOLD	9
5	MPBG00	PAD,LCD	MPBG0102901	COMPLEX, (empty), , , , ,	WITHOUT COLOR	12
5	MPBJ00	PAD,MOTOR	MPBJ0071201	COMPLEX, (empty), , , , ,	WITHOUT COLOR	14
5	MPBN00	PAD,SPEAKER	MPBN0076101	COMPLEX, (empty), , , , ,	WITHOUT COLOR	13
5	MTAD00	TAPE,WINDOW	MTAD0118001	COMPLEX, (empty), , , , ,	WITHOUT COLOR	4
5	MTAZ00	TAPE	MTAZ0321401	COMPLEX, (empty), , , , ,	WITHOUT COLOR	15
5	MTAZ01	TAPE	MTAZ0321301	COMPLEX, (empty), , , , ,	WITHOUT COLOR	8
5	MTAZ03	TAPE	MTAZ0268501	COMPLEX, (empty), , , , ,	WITHOUT COLOR	6
5	MTAZ04	TAPE	MTAZ0269401	COMPLEX, (empty), , , , ,	WITHOUT COLOR	10
4	AKAC00	KEYPAD ASSY,MAIN	AKAC0005601		WITHOUT COLOR	D, 17
4	MTAB00	TAPE,PROTECTION	MTAB0359901	COMPLEX, (empty), , , , ,	WITHOUT COLOR	A, 1
4	MTAB01	TAPE,PROTECTION	MTAB0412601	COMPLEX, (empty), , , , ,	WITHOUT COLOR	J, 58

Level	Location No.	Description	Part Number	Spec	Color	Remark
4	MWAC00	WINDOW,LCD	MWAC0132701	CUTTING, PMMA MR 200, , , , ,	WITHOUT COLOR	B, 2
3	GMEY	SCREW MACHINE,BIND	GMEY0007902	1.4 mm,4.5 mm,MSWR3 ,A ,ETC , ,; ,CS ,+ ,2.5 ,4.5 ,SWRH ,BLACK ,PLAIN ,A	BLACK	G, 55
3	MCJA00	COVER,BATTERY	MCJA0102501	MOLD, PC LUPOY SC-1004A, , , , ,	BLACK	I, 57
3	MLAA00	LABEL,APPROVAL	MLAA0062303	COMPLEX, (empty), , , , ,	WITHOUT COLOR	
5	ACKA00	CAN ASSY,SHIELD	ACKA0022301		WITHOUT COLOR	
6	MCBA00	CAN,SHIELD	MCBA0066101	PRESS, STS, , , , ,	WITHOUT COLOR	21
6	MGAZ00	GASKET	MGAZ0093101	COMPLEX, (empty), , , , ,	WITHOUT COLOR	25
6	MIDZ00	INSULATOR	MIDZ0241001	COMPLEX, (empty), , , , ,	WITHOUT COLOR	23
6	MLAB	LABEL,A/S	MLAB0001102	C2000 USASV DIA 4.0	WHITE	22
6	MPBZ00	PAD	MPBZ0282701	COMPLEX, (empty), , , , ,	AIRY BLUE	24
5	ADCA00	DOME ASSY,METAL	ADCA0106401		WITHOUT COLOR	18
5	MIDZ00	INSULATOR	MIDZ0253101	COMPLEX, (empty), , , , ,	WITHOUT COLOR	
5	MIDZ02	INSULATOR	MIDZ0252501	COMPLEX, (empty), , , , ,	WITHOUT COLOR	20
6	ANT303	CONTACT	MCIZ0001501	PRESS, BeCu, , , , ,	WITHOUT COLOR	
6	SC200	CAN,SHIELD	MCBA0059201	PRESS, STS, , , , ,	WITHOUT COLOR	

12.2 Replacement Parts
<Main component>

Level	Location No.	Description	Part Number	Spec	Color	Remark
1		GSM,BAR/FILP	TGSM0072001		BLACK	
4	SNGF00	ANTENNA,GSM,FIXED	SNGF0056001	3.0 ,-5.0 dBd,, ,internal, FM, FPCB type ,; ,SINGLE ,-5.0 ,50 ,3.0		51
4	SNGF01	ANTENNA,GSM,FIXED	SNGF0056101	3.0 ,-5.0 dBd,, ,internal, bluetooth ,; ,SINGLE ,-5.0 ,50 ,3.0		37
4	SNGF02	ANTENNA,GSM,FIXED	SNGF0056201	3.0 ,-5.0 dBd,, ,internal, GSM850/900/1800/1900 ,; ,QUAD ,-5.0 ,50 ,3.0		40
4	SVLM00	LCD MODULE	SVLM0030202	Main ,3.0" ,240*320 ,74.9*44.88 ,262K ,TFT ,TM ,R61509 ,		
3	SAFY	PCB ASSY,MAIN	SAFY0332501			E, 19
4	SAFB00	PCB ASSY,MAIN,INSERT	SAFB0111401			
5	BRAH00	RESIN,PC	BRAH0001301	; , , , ,[empty]	Black	
5	SJMY00	VIBRATOR,MOTOR	SJMY0007108	3 V,80 mA,10*3.0 ,12mm ,; ,3V , , , , , , ,		
5	SPKY00	PCB,SIDEKEY	SPKY0077101	POLYI , mm,MULTI-2 , ,; , , , , , , , , ,		
5	SPKY01	PCB,SIDEKEY	SPKY0081101	POLYI ,0.2 mm,DOUBLE , ,; , , , , , , , , ,		
5	SPKY02	PCB,SIDEKEY	SPKY0081401	POLYI ,0.75 mm,MULTI-2 , ,; , , , , , , , , ,		
5	SUSY00	SPEAKER	SUSY0028902	ASSY ,8 ohm,91 dB,1812 mm,3.0T 15mm ,; , , , , , , ,[empty]		
5	SVCY00	CAMERA	SVCY0020301	CMOS ,MEGA ,2M FF SS-LSI(1/5"), 7x7x4.1,Socket		
4	SAFF00	PCB ASSY,MAIN,SMT	SAFF0246201			
5	SAFC00	PCB ASSY,MAIN,SMT BOTTOM	SAFC0130901			
6	C100	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C101	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C102	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C103	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C104	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C105	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C106	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C107	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C108	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C109	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C110	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C111	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C112	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C113	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C114	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C115	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C116	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C117	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C118	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C119	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C120	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C121	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C122	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C123	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C124	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C125	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C126	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C127	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C128	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C129	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C130	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C131	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C132	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C133	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C134	CAP,CHIP,MAKER	ECZH0001216	220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C135	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C136	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C137	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C138	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C139	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C140	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C141	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C142	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C143	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C144	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C145	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C146	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C200	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C201	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C202	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C203	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C204	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C205	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C206	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C207	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C208	CAP,CERAMIC,CHIP	ECCH0005604	10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm		
6	C209	CAP,CERAMIC,CHIP	ECCH0005603	2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP		
6	C210	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C211	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C212	CAP,CHIP,MAKER	ECZH0003503	1 uF,25V ,K ,X5R ,HD ,1608 ,R/TP		
6	C214	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C215	CAP,CERAMIC,CHIP	ECCH0005604	10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm		
6	C216	CAP,CERAMIC,CHIP	ECCH0005604	10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm		
6	C217	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C219	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C220	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C222	CAP,CERAMIC,CHIP	ECCH0005604	10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm		
6	C223	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C224	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C225	CAP,CERAMIC,CHIP	ECCH0005604	10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm		
6	C226	CAP,CERAMIC,CHIP	ECCH0005603	2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP		
6	C227	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C228	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C229	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C230	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C231	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C232	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C233	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C234	CAP,CERAMIC,CHIP	ECCH0017501	22 uF,6.3V ,M ,X5R ,HD ,1608 ,R/TP ,; , ,20% ,6.3V ,X5R ,-55TO+85C ,1608 ,R/TP , mm		
6	C235	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C236	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C237	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C238	CAP,CERAMIC,CHIP	ECCH0005603	2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP		
6	C239	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C240	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C241	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C301	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C302	CAP,CHIP,MAKER	ECZH0000822	1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C303	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C304	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C305	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C306	CAP,CHIP,MAKER	ECZH0001116	270 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C307	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C308	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C309	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C310	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C311	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C312	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C313	CAP,CERAMIC,CHIP	ECCH0017601	4.7 uF,6.3V ,M ,X5R ,HD ,1005 ,R/TP ,; , ,20% ,6.3V ,X5R ,-55TO+85C ,1005 ,R/TP , mm		
6	C314	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C315	CAP,CERAMIC,CHIP	ECCH0000129	120 pF,50V,J,NP0,TC,1005,R/TP		
6	C316	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C317	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C318	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C319	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C320	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C321	CAP,CHIP,MAKER	ECZH0001216	220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C322	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C324	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C325	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C330	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C331	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C332	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C333	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C336	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C337	CAP,CERAMIC,CHIP	ECCH0005603	2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP		
6	C338	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C339	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	C341	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C342	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C343	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C344	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C347	CAP,CHIP,MAKER	ECZH0001216	220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C349	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C350	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C351	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C353	CAP,CHIP,MAKER	ECZH0003118	560 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C354	CAP,CHIP,MAKER	ECZH0003118	560 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C355	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C356	CAP,CERAMIC,CHIP	ECCH0005603	2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP		
6	C357	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C358	CAP,CHIP,MAKER	ECZH0001116	270 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C361	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C362	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C363	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C364	CAP,CHIP,MAKER	ECZH0001216	220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C365	CAP,CHIP,MAKER	ECZH0001216	220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C366	CAP,CERAMIC,CHIP	ECCH0000137	330 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C368	CAP,CERAMIC,CHIP	ECCH0000137	330 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C369	CAP,CERAMIC,CHIP	ECCH0000137	330 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C370	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C371	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C373	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C374	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C375	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C376	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C377	CAP,CHIP,MAKER	ECZH0001217	470 nF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C378	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C379	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C381	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C382	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C384	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C401	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C402	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C403	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C404	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C405	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C406	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C407	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C408	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C410	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C411	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C412	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C414	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C415	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C416	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C417	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C419	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C420	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C425	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C426	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C500	CAP,CERAMIC,CHIP	ECCH0017501	22 uF,6.3V ,M ,X5R ,HD ,1608 ,R/TP ,; , ,20% ,6.3V ,X5R ,-55TO+85C ,1608 ,R/TP , mm		
6	C501	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C503	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C505	INDUCTOR,CHIP	ELCH0003847	1.8 nH,S ,1005 ,R/TP ,chip coil		
6	C506	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C507	INDUCTOR,CHIP	ELCH0003847	1.8 nH,S ,1005 ,R/TP ,chip coil		
6	C508	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C509	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C510	CAP,CHIP,MAKER	ECZH0000802	1 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C511	CAP,CHIP,MAKER	ECZH0001216	220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C512	CAP,CERAMIC,CHIP	ECCH0000175	2.7 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C513	CAP,CERAMIC,CHIP	ECCH0000175	2.7 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C514	CAP,CHIP,MAKER	ECZH0000839	4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C515	CAP,CHIP,MAKER	ECZH0000839	4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C516	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C517	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C518	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C520	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C521	CAP,CERAMIC,CHIP	ECCH0000151	4.7 nF,25V,K,X7R,HD,1005,R/TP		
6	C522	CAP,CHIP,MAKER	ECZH0001216	220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C524	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C525	CAP,CERAMIC,CHIP	ECCH0000901	2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C526	CAP,CHIP,MAKER	ECZH0000839	4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C527	CAP,CHIP,MAKER	ECZH0000839	4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C530	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C531	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C534	CAP,CERAMIC,CHIP	ECCH0000901	2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C535	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C536	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C537	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	CN200	CONNECTOR,I/O	ENRY0008801	5 , mm,ANGLE , , ,; , ,0.64MM ,ANGLE ,[empty] ,DIP ,[empty] ,		
6	CN300	CONNECTOR,ETC	ENZY0019802	3 ,2.5 mm,ETC ,- ,-		
6	CN402	CONNECTOR,BOARD TO BOARD	ENBY0036001	40 PIN,0.4 mm,ETC , ,H=1.0, Socket		
6	D200	DIODE,SWITCHING	EDSY0019201	ESC ,85 V,0.3 A,R/TP , ,; , ,85 ,300mA , ,4.0nS MAX ,150mW ,ESC ,R/TP ,2P ,[empty]		
6	D201	DIODE,SWITCHING	EDSY0019201	ESC ,85 V,0.3 A,R/TP , ,; , ,85 ,300mA , ,4.0nS MAX ,150mW ,ESC ,R/TP ,2P ,[empty]		
6	D300	DIODE,TVS	EDTY0008606	DFN-2 ,7.82 V,150 mW,R/TP ,PB-FREE		
6	FB200	FILTER,BEAD,CHIP	SFBH0008105	1800 ohm,1005 ,Chip bead ,; ,1800ohm ,; ,[empty] ,R/TP		
6	FB201	FILTER,BEAD,CHIP	SFBH0009201	220 ohm,1608 ,		
6	FB202	FILTER,BEAD,CHIP	SFBH0009201	220 ohm,1608 ,		
6	FB300	RES,CHIP,MAKER	ERHZ0000249	22 ohm,1/16W ,F ,1005 ,R/TP		
6	FB303	FILTER,BEAD,CHIP	SFBH0008105	1800 ohm,1005 ,Chip bead ,; ,1800ohm ,; ,[empty] ,R/TP		
6	FB304	FILTER,BEAD,CHIP	SFBH0008105	1800 ohm,1005 ,Chip bead ,; ,1800ohm ,; ,[empty] ,R/TP		
6	FB305	FILTER,BEAD,CHIP	SFBH0007101	120 ohm,1005 ,Ferrite Bead		
6	FB306	FILTER,BEAD,CHIP	SFBH0007101	120 ohm,1005 ,Ferrite Bead		
6	FB307	FILTER,BEAD,CHIP	SFBH0008105	1800 ohm,1005 ,Chip bead ,; ,1800ohm ,; ,[empty] ,R/TP		
6	FB308	FILTER,BEAD,CHIP	SFBH0008105	1800 ohm,1005 ,Chip bead ,; ,1800ohm ,; ,[empty] ,R/TP		
6	FB309	FILTER,BEAD,CHIP	SFBH0008105	1800 ohm,1005 ,Chip bead ,; ,1800ohm ,; ,[empty] ,R/TP		
6	FL300	FILTER,CERAMIC	SFCY0000901	2450 MHz,2.00*1.25*0.95 ,SMD ,Bluetooth Band Pass Filter		
6	FL400	FILTER,EMI/POWER	SFEY0010501	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free		
6	FL401	FILTER,EMI/POWER	SFEY0010501	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free		
6	FL402	FILTER,EMI/POWER	SFEY0010501	SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free		
6	FL500	FILTER,SEPERATOR	SFAY0012001	, , dB, dB, dB, dB,4532 ,IFX EDGE Quad Pin		
6	J300	CONN,JACK/PLUG,EARPHONE	ENJE0007501	,6 , ,; ,4P ,[empty] ,[empty] ,[empty] , ,[empty] ,13.2x6.1x4.32t		
6	J400	CONN,SOCKET	ENSY0025101	6 ,ETC , ,2.54 mm,6pin, 1.8t, Bridge Type, Stopper		
6	L200	INDUCTOR,SMD,POWER	ELCP0006703	10 uH,M ,3.2*2.6*1.0 ,R/TP ,		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	L201	INDUCTOR,SMD,POWER	ELCP0006703	10 uH,M ,3.2*2.6*1.0 ,R/TP ,		
6	L301	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
6	L302	INDUCTOR,CHIP	ELCH0010302	100 nH,J ,1608 ,R/TP ,chip coil		
6	L303	INDUCTOR,CHIP	ELCH0003842	100 nH,J ,1005 ,R/TP ,MLCI		
6	L307	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
6	L308	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
6	L309	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
6	L313	INDUCTOR,CHIP	ELCH0010402	270 nH,M ,1005 ,R/TP ,CHIP		
6	L315	INDUCTOR,CHIP	ELCH0005019	68 nH,J ,1005 ,R/TP ,		
6	L316	INDUCTOR,CHIP	ELCH0005019	68 nH,J ,1005 ,R/TP ,		
6	L318	INDUCTOR,CHIP	ELCH0003842	100 nH,J ,1005 ,R/TP ,MLCI		
6	L319	INDUCTOR,CHIP	ELCH0003842	100 nH,J ,1005 ,R/TP ,MLCI		
6	L501	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
6	L502	INDUCTOR,CHIP	ELCH0004714	18 nH,J ,1005 ,R/TP ,		
6	L503	INDUCTOR,CHIP	ELCH0003814	5.1 nH,S ,1005 ,R/TP ,5.1nH,1005		
6	L504	CAP,CERAMIC,CHIP	ECCH0000901	2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	L505	INDUCTOR,CHIP	ELCH0004710	15 nH,J ,1005 ,R/TP ,		
6	L506	INDUCTOR,CHIP	ELCH0004704	4.7 nH,S ,1005 ,R/TP ,		
6	M300	MODULE,ETC	SMZY0023501	3.8 Backup Capacitor 0.03F ,; ,Module Assembly		
6	PT500	THERMISTOR	SETY0006301	NTC ,10000 ohm,SMD ,1005, 3350~3399k, J, R/T, PBFREE		
6	Q200	TR,BJT,NPN	EQBN0020501	ESM ,0.15 W,R/TP , ,; ,NPN ,5V ,60V ,50V ,150mA ,0.1uA MAX ,10 MIN 700 MAX ,100mW ,ESM ,R/TP ,3P		
6	Q201	TR,BJT,NPN	EQBN0020501	ESM ,0.15 W,R/TP , ,; ,NPN ,5V ,60V ,50V ,150mA ,0.1uA MAX ,10 MIN 700 MAX ,100mW ,ESM ,R/TP ,3P		
6	Q300	TR,BJT,NPN	EQBN0012401	ESM ,100 mW,R/TP ,NPN TRANSISTOR		
6	R100	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		
6	R101	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R102	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R103	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R104	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R105	RES,CHIP,MAKER	ERHZ0000267	3300 ohm,1/16W ,F ,1005 ,R/TP		
6	R106	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	R107	RES,CHIP,MAKER	ERHZ0000244	22 Kohm,1/16W ,F ,1005 ,R/TP		
6	R108	RES,CHIP,MAKER	ERHZ0000204	100 Kohm,1/16W ,F ,1005 ,R/TP		
6	R109	RES,CHIP	ERHY0000166	390 Kohm,1/16W ,F ,1005 ,R/TP		
6	R110	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R111	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R114	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R118	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R200	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R204	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R206	RES,CHIP,MAKER	ERHZ0000267	3300 ohm,1/16W ,F ,1005 ,R/TP		
6	R207	RES,CHIP	ERHY0000185	820 ohm,1/16W ,F ,1005 ,R/TP		
6	R209	RES,CHIP,MAKER	ERHZ0000457	30 ohm,1/16W ,J ,1005 ,R/TP		
6	R210	RES,CHIP,MAKER	ERHZ0000457	30 ohm,1/16W ,J ,1005 ,R/TP		
6	R211	RES,CHIP,MAKER	ERHZ0000467	330 Kohm,1/16W ,J ,1005 ,R/TP		
6	R212	RES,CHIP	ERHY0000283	130K ohm,1/16W,J,1005,R/TP		
6	R214	RES,CHIP,MAKER	ERHZ0000454	27 Kohm,1/16W ,J ,1005 ,R/TP		
6	R215	RES,CHIP,MAKER	ERHZ0000204	100 Kohm,1/16W ,F ,1005 ,R/TP		
6	R216	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R217	RES,CHIP	ERHY0000277	75K ohm,1/16W,J,1005,R/TP		
6	R218	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R219	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R221	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R222	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R223	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R224	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R226	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R227	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R228	RES,CHIP,MAKER	ERHZ0000437	2 Kohm,1/16W ,J ,1005 ,R/TP		
6	R301	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R303	RES,CHIP,MAKER	ERHZ0000529	1.5 Kohm,1/16W ,J ,1005 ,R/TP		
6	R304	INDUCTOR,CHIP	ELCH0010402	270 nH,M ,1005 ,R/TP ,CHIP		
6	R305	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	R307	RES,CHIP,MAKER	ERHZ0000445	220 Kohm,1/16W ,J ,1005 ,R/TP		
6	R308	RES,CHIP,MAKER	ERHZ0000407	1000 Kohm,1/16W ,J ,1005 ,R/TP		
6	R309	INDUCTOR,CHIP	ELCH0003842	100 nH,J ,1005 ,R/TP ,MLCI		
6	R310	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R311	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R312	RES,CHIP	ERHY0003201	1000 ohm,1/16W ,F ,1005 ,R/TP		
6	R314	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R315	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	R318	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R319	RES,CHIP,MAKER	ERHZ0000483	47 ohm,1/16W ,J ,1005 ,R/TP		
6	R321	RES,CHIP,MAKER	ERHZ0000530	5.1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R322	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R323	RES,CHIP,MAKER	ERHZ0000439	200 Kohm,1/16W ,J ,1005 ,R/TP		
6	R324	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R325	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R330	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R333	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R334	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R341	RES,CHIP,MAKER	ERHZ0000429	180 ohm,1/16W ,J ,1005 ,R/TP		
6	R342	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R343	RES,CHIP,MAKER	ERHZ0000285	470 ohm,1/16W ,F ,1005 ,R/TP		
6	R345	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R346	RES,CHIP	ERHY0000147	56K ohm,1/16W,F,1005,R/TP		
6	R347	RES,CHIP	ERHY0000147	56K ohm,1/16W,F,1005,R/TP		
6	R349	RES,CHIP,MAKER	ERHZ0000456	2.2 ohm,1/16W ,J ,1005 ,R/TP		
6	R404	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R405	RES,CHIP,MAKER	ERHZ0000486	47 Kohm,1/16W ,J ,1005 ,R/TP		
6	R407	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R408	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R409	RES,CHIP,MAKER	ERHZ0000486	47 Kohm,1/16W ,J ,1005 ,R/TP		
6	R410	RES,CHIP,MAKER	ERHZ0000486	47 Kohm,1/16W ,J ,1005 ,R/TP		
6	R411	RES,CHIP,MAKER	ERHZ0000486	47 Kohm,1/16W ,J ,1005 ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	R412	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R414	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R415	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R417	RES,CHIP,MAKER	ERHZ0000486	47 Kohm,1/16W ,J ,1005 ,R/TP		
6	R418	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R419	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R420	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R423	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R424	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R425	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R426	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R427	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R501	INDUCTOR,CHIP	ELCH0003831	1 nH,S ,1005 ,R/TP ,MLCI		
6	R502	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R504	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R505	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R506	RES,CHIP,MAKER	ERHZ0000206	10 ohm,1/16W ,F ,1005 ,R/TP		
6	R507	RES,CHIP,MAKER	ERHZ0000206	10 ohm,1/16W ,F ,1005 ,R/TP		
6	R508	RES,CHIP	ERHY0000185	820 ohm,1/16W ,F ,1005 ,R/TP		
6	R509	RES,CHIP,MAKER	ERHZ0000244	22 Kohm,1/16W ,F ,1005 ,R/TP		
6	S400	CONN,SOCKET	ENSY0022201	24 ,ETC , , mm,7*7, 1.3M (1/5") Socket Type		
6	S401	CONN,SOCKET	ENSY0023301	8 ,ETC , ,0.7 mm,H=1.52,(15*15)		
6	SW500	CONN,RF SWITCH	ENWY0007901	,SMD , dB, =3.0, H=1.8, (3.2*3.0) ,; ,0.13MM ,STRAIGHT ,RF ADAPTER ,[empty] ,[empty] ,[empty] , ,		
6	U100	IC	EUSY0322801	BGA ,10 ,R/TP ,Multimedia Extension EDGE BB, 313 Ball , ,IC,Digital Baseband Processor		
6	U101	IC	EUSY0388101	FBGA ,149 ,ETC ,FULLY 1.8V 2G(LB/128Mx16) NAND+1G(DDR/16Mx4x16) SDRAM ,; ,IC,MCP		
6	U200	IC	EUSY0371201	WLP ,20 ,R/TP ,MUIC for 5Pin Micro USB ,; ,IC,Analog Switch		
6	U201	IC	EUSY0388501	DFN ,10 ,R/TP ,Cal Test Mode Single Charger IC for Micro USB ,; ,IC,Charger		
6	U202	IC	EUSY0323901	BGA PG-WFSGA ,121 PIN,R/TP ,SMPOWER3		
6	U300	IC	EUSY0250501	SC70 ,5 PIN,R/TP ,Comparator, pin compatible to EUSY0077701		

Level	Location No.	Description	Part Number	Spec	Color	Remark
6	U301	IC	EUSY0394501	WLCSP ,39 ,R/TP ,3.2x3.6x0.6, BT2.1+FM Rx/Tx, 90n ,; ,IC,Bluetooth		
6	U302	IC	EUSY0412801	SSON ,4 ,R/TP ,150mA Single LDO ,; ,IC,LDO Voltage Regulator		
6	U303	IC	EUSY0404001	BGA ,8 ,R/TP ,Class AB SPK Amp ,; ,IC,Audio Amplifier		
6	U304	IC	EUSY0390501	WLCSP ,20 ,R/TP , ,; ,IC,Audio Sub System		
6	U305	IC	EUSY0393101	,7 ,R/TP ,For SDMB(VC350) FM Radio ,; ,IC,RF Amplifier		
6	U306	IC	EUSY0363501	uMLF ,10 ,R/TP ,0.4ohm Audio Analog Switch ,; ,IC,Analog Switch		
6	U400	IC	EUSY0337101	CSP ,12 PIN,R/TP ,Touchscreen Controller IC , ,IC,A/D Converter		
6	U401	IC	EUSY0336502	, PIN,R/TP , ,; ,IC,Charge Pump		
6	U402	IC	EUSY0405501	SSON004 ,4 ,R/TP ,150mA 1.5V Single LDO ,; ,IC,LDO Voltage Regulator		
6	U500	IC	EUSY0274801	VQFN ,40 PIN,R/TP ,GPRS, EDGE TRANSCEIVER		
6	U501	PAM	SMPY0017601	dBm, %, A, dBc, dB,5x5 ,SMD ,IFX Linear EDGE ,; , , , , , , , ,R/TP ,R/TP ,16		
6	VA303	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		
6	VA305	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		
6	VA308	DIODE,TVS	EDTY0008606	DFN-2 ,7.82 V,150 mW,R/TP ,PB-FREE		
6	VA401	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA402	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA406	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		
6	VA407	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		
6	VA408	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA409	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA410	VARISTOR	SEVY0001001	14 V, ,SMD ,50pF, 1005		
6	VA411	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		
6	VA412	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		
6	VA413	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		
6	VA415	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		
6	VA416	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		
6	X100	X-TAL	EXXY0018701	32.768 KHz,20 PPM,12.5 pF,70 Kohm,SMD ,3.2*1.5*0.9 ,		
6	X500	X-TAL	EXXY0025701	26 MHz,10 PPM,8 pF,40 ohm,SMD ,32X25X0.6 ,X-Tal (Infinion chip), Pb-Free ,; , ,10PPM , , , ,SMD ,R/TP		

Level	Location No.	Description	Part Number	Spec	Color	Remark
5	SAFD00	PCB ASSY,MAIN,SMT TOP	SAFD0127801			
6	CN400	CONNECTOR,ETC	ENZY0020701	4 PIN, mm,BOTTOM , ,		
6	LD400	DIODE,LED,CHIP	EDLH0012504	Snow White ,1608 ,R/TP ,color concept		
6	LD401	DIODE,LED,CHIP	EDLH0012504	Snow White ,1608 ,R/TP ,color concept		
6	LD402	DIODE,LED,CHIP	EDLH0012504	Snow White ,1608 ,R/TP ,color concept		
6	LD403	DIODE,LED,CHIP	EDLH0012504	Snow White ,1608 ,R/TP ,color concept		
6	LD404	DIODE,LED,CHIP	EDLH0012504	Snow White ,1608 ,R/TP ,color concept		
6	LD405	DIODE,LED,CHIP	EDLH0012504	Snow White ,1608 ,R/TP ,color concept		
6	MIC300	MICROPHONE	SUMY0010610	UNIT ,-42 dB,4.72*3.76*1.25 ,mems TDMA Improve ,; , , ,OMNI ,[empty] , ,SMD		
6	R402	RES,CHIP,MAKER	ERHZ0000411	120 ohm,1/16W ,J ,1005 ,R/TP		
6	R406	RES,CHIP,MAKER	ERHZ0000411	120 ohm,1/16W ,J ,1005 ,R/TP		
6	R413	RES,CHIP,MAKER	ERHZ0000411	120 ohm,1/16W ,J ,1005 ,R/TP		
6	R416	RES,CHIP,MAKER	ERHZ0000411	120 ohm,1/16W ,J ,1005 ,R/TP		
6	R421	RES,CHIP,MAKER	ERHZ0000411	120 ohm,1/16W ,J ,1005 ,R/TP		
6	R422	RES,CHIP,MAKER	ERHZ0000411	120 ohm,1/16W ,J ,1005 ,R/TP		
6	SPFY00	PCB,MAIN	SPFY0204501	FR-4 ,0.8 mm,STAGGERED-6 , ,; , , , , , , , , ,		
6	VA300	VARISTOR	SEVY0004101	5.6 V, ,SMD ,360pF, 1005		
6	VA302	VARISTOR	SEVY0004101	5.6 V, ,SMD ,360pF, 1005		
6	VA304	VARISTOR	SEVY0005202	5.5 V,+-30 ,SMD ,1005, 100 pF, Pb free		
6	VA306	VARISTOR	SEVY0005202	5.5 V,+-30 ,SMD ,1005, 100 pF, Pb free		
6	VA307	VARISTOR	SEVY0005202	5.5 V,+-30 ,SMD ,1005, 100 pF, Pb free		
6	VA309	VARISTOR	SEVY0005202	5.5 V,+-30 ,SMD ,1005, 100 pF, Pb free		
6	VA405	VARISTOR	SEVY0003901	5.5 V, ,SMD ,Vdc 5.5, Vb 8, Cp 420, 1.0*0.5*0.6 , ,5.5 , ,480 ,1.0*0.5*0.6 ,[empty] ,SMD ,R/TP		